POWER, TECHNO-ECONOMICS, AND TRANSATLANTIC RELATIONS IN 1987-1999

by

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Abstract:

This essay suggests that in 1987-1999 European elites, in their efforts of asymmetric balancing against the United States hegemony, decided to trade-off military capability for economic competitiveness. Thus, it documents a correlation between a) the reluctance of especially France and Germany during the 1990s to fully embrace and pursue the US-led RMA; and, b) the European Union's efforts since the late 1980s to challenge America's technological and economic supremacy in the aerospace sector. Two projects (Airbus and Galileo) indicate that the quest for strategic independence and the fear of reduced influence in international affairs were the driving forces behind European efforts to challenge the US commercial and technological supremacy in the aerospace sector in 1987-99. Furthermore, the article tries to identify what role the RMA played in this context (focusing in particular on Germany and France). It argues also that since the late 1980s (and especially during the 1990s), the European Commission and countries such as France and Germany perceived US policies in high-technology sectors (accentuated also by vigorous pursuit of the RMA) as limiting Europe's abilities to advance its own agenda in international economic and security affairs.

> It is interest, not volition, that will produce a deepening rivalry between Europe and the United States during the decades to come, with competitive searches for economic and political influence in the rest of the world. To the extent that European industrial and technological sovereignty is threatened by a form of competition that leaves only winners and losers, European political sovereignty -- the most fundamental of interests -- is threatened.[1] (William Pfaff, 1998)

Introduction

The Single European Act (SEA) has begun implementation in 1987 and had since notable consequences for the commercial strategies of those European[2] high-technology companies that undertake both civilian and military production.[3] The same year *Airbus Industrie* began its offensive against the US air manufacturers with the launch of the A-320 model.

Several developments in 1999 had relevant consequences for the transatlantic relationship. First, the "capabilities gap" highlighted by the Kosovo air war of March-June 1999 gave new impetus in key European capitals to the debate concerning the transatlantic "capabilities gap" that increased during the 1990s also due to the US promoted revolution in military affairs (RMA). Second, the first truly transnational European aerospace and defense company -- European Aeronautic Defense and Space Company (EADS) was created. It is also the year when the European Union (EU) decided to officially launch Galileo – the autonomous satellite navigation system intended to challenge the American GPS commercial and military monopoly.

Finally, much has been written about the growing technology and capability gap between the US and its key European allies, but little about why this is so, beyond the usual focus on declining defense budgets.

Against this background, this article suggests that European elites, in their efforts of asymmetrically balancing against the United States hegemony, decided in 1987-99 to trade-off military capability for economic competitiveness. Thus, the essay documents a possible correlation between a) the reluctance of especially France and Germany during the 1990s to fully embrace and pursue the US-led RMA; and, b) the EU's efforts since the late 1980s to challenge America's technological and economic supremacy in the aerospace sector.

Two projects (Airbus and Galileo) indicate that the quest for strategic independence and the fear of reduced influence in international affairs were the driving forces behind European efforts to challenge the US commercial and technological supremacy in the aerospace sector in 1987-99.[4]

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[1] William Pfaff, "The coming clash of Europe with America," *World Policy Journal* 15, no. 4 (Winter 1998/99); accessed via the *Expanded Academic ASAP* database.

[2] For the purposes of this article the author will go along with the tendency of many journalists and politicians and will use "Europe" as shorthand for the European Community/European Union member countries as a whole.

[3] William Walker and Philip Gummett, "Britain and the European armaments market," *International Affairs* 65, no.3 (Summer 1989): 420.

[4] One basic remark is necessary: the two European strategic projects only appear so fully in retrospect, as is often the case with strategic choices in general.

Furthermore, this article tries to identify what role the RMA played in this context (focusing in particular on Germany and France). It argues that since the late 1980s (and especially during the 1990s), the European Commission and countries such as France and Germany perceived US policies in high-technology sectors (accentuated also by vigorous pursuit of the RMA) as limiting Europe's abilities to advance its own agenda in international economic and security affairs.

Besides the current divergences in the transatlantic relationship, two other elements justify this interpretation of events. First, leadership's ambitions and dissatisfaction with the *status quo* are commonly accepted as factors that might motivate a nation (or a group of nations) to develop policies intended to challenge the existing configurations of power in the international system.[5] Second, one may need fresh thinking when examining an old question -- the relationship between technology, wealth, and power among the Western allies -- in an international security environment fundamentally different from the Cold War years.

European discourse about the technological race with the US

For European elites, the debate over the economic and technological race with the US and the "lagging-behind" theme is not entirely new. Any observer of the Cold War transatlantic relationship would immediately identify two periods characterized by intense European discussions on this topic. First, in the mid-1960s Europeans perceived that their industries were behind by the American competitors due to an alarming technological gap.[6] This was followed by the 1980s, which witnessed a reawakening of European concerns about lagging competitiveness in the area of high-technology "this time not just *vis-à-vis* America, but also in relation to Japan."[7] Furthermore, by one account, in the late 1980s the primary areas of insecurity for the European economies were generally perceived "as the interrelated issues of increasing technological dependency and declining international competitiveness."[8]

Two new elements significantly modified the European discourse during the 1990s with regard to the most recent technology gap "fever" *vis-à-vis* the US. On the one hand, the concern has deepened: Servan-Schreiber's "American challenge" was bluntly replaced with a "threat" coming from America's high-technology industries. On the other hand, the focus shifted to include sectors with relevance for the EU's increasingly evident autonomous defense and security ambitions. As a study carried out between 1998 and 2000 for the EU Commission pointed out:

> A new threat perception, arising not from the east but from the west, emerged in Europe during the second half of the 1990s. It was not a threat to national security

[5] Thomas Szayna, Daniel Byman, Steven Bankes, Derek Eaton, Seth Jones, Robert Mullins, Ian Lesser, and William Rosenau, *The Emergence of Peer Competitors: A Framework for Analysis*, MR 1346 (Santa Monica, CA: Rand Corporation, 2001): 10.

[6] Jean-Jacques Servan-Schreiber, *Le défi américain* (Paris: Denoël, 1967).

[7] John Peterson and Margaret Sharp, *Technology Policy in the European Union* (New York: St. Martin's Press, 1998): 68.

[8] Thomas Lawton, *Technology and the New Diplomacy: The creation and control of EC industrial policy for semiconductors* (Aldershot: Ashgate Publishing Company, 1998): 36.

and independence, but to European military-industrial survival and advanced technology competitiveness.[9]

The re-emerging "American threat" was a direct consequence of how Europeans evaluated the technology policy promoted by the Clinton Administration.[10] Even if the fundamental intent of many American programs was domestic, the comprehensive set of initiatives taken by the US Government after 1992 in high-technology, defense industrial, and exports promotion policies was perceived in Europe as promoting an enhanced role of economic and technological issues in defining America's national security priorities.

Three measures in particular led German and French observers to warn that the EU must deal with a changed US perception of technology as an element of "economic security."[11] First, the creation in early 1993 of the National Economic Council (NEC) coupled with the establishment in 1994 of the position of Assistant Secretary of Defense for Economic Security indicated that the Clinton administration was proposing a strong link between the preservation of American military and technological power and the vigorous pursuit of its own economic interests in global markets.[12]

Second, the launching of the Technology Reinvestment Program (TRP) in 1993 was the largest "dual-use" technology development effort ever attempted by the US Department of Defense (DoD). Its goals were to "spin-off" defense technologies into commercial fields; lower costs for new defense technologies; and develop militarily useful and commercially viable technology in order to improve the DoD's access to affordable and advanced technology. For achieving its purposes, the TRP redirected US federal funds allocated for defense R&D towards the development of "dual-use" technologies and, as such, it guided the private sector into strategic industrial sectors (Chart 1).[13]

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[9] METDAC report, *Conclusions and Policy Implications: As set out in the Final Report to the European Commission* (January 2001). "The Management of European Technology: Defense and Competitiveness Issues" (METDAC) thematic network has been funded by the EU Commission from spring 1998 to autumn 2000. Report (accessed on April 20, 2001) from http://www.spsg.org/credit/CREDIT-METDAC-study/index.html.

[10] It must be said that such an assessment is not entirely new. For example, during the Carter administration, the US push in NATO for the pursuit of what were then called "emerging technologies" evoked concern not only in Moscow but also in some quarters in Europe. During the Reagan period, one should mention the European reactions to the Strategic Defense Initiative (SDI), including the European Research Coordination Agency (EUREKA) program. For an analysis of the origins and the development of the EUREKA program during the 1980s and early 1990s, see John Peterson, *High Technology and the Competition State: An analysis of the Eureka initiative* (London: Routledge, 1993).

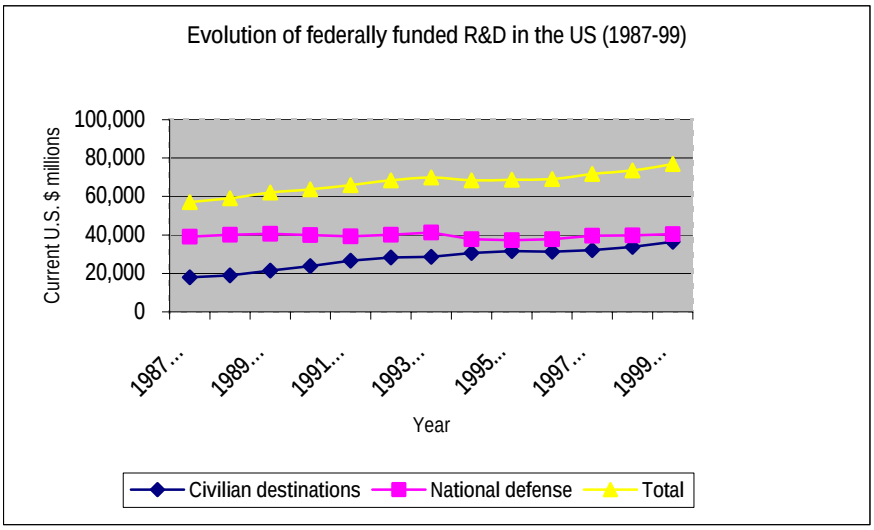
[11] Joachim Rhode and Jens van Scherpenberg, *Defence/Civilian Technology Trends -- the Security/Economic Challenge* in European Commission/DGI - Seminars on Economic Security, organized in the framework of the ESAN project - Arms production and cooperation, unpublished manuscript (Ebenhausen, Germany: Stiftung Wissenschaft und Politik, 1996): 4-12; and, Gilles Marcoin, "Le concept de sécurité économique: un défi pour l'Europe," in Nichole Chaix, ed., *Economie et sécurité: de l'industrie de défense a l'intelligence économique* (Paris: Fondation pour les Etudes de Defense, 1996): 125-34. Marcoin was then Vice President for Business Development at Dassault Aviation S.A.

[12] The NEC was created to give weight to economic policy domestically and force it to the President's attention and was established by the *Presidential Executive Order 12835* (January 25, 1993). The analogy to the National Security Council was also a move simply intended to gain domestic attention. Furthermore, the position of Assistant Secretary of Defense for Economic Security was short-lived; it was disestablished in 1996.

[13] See, for example, James Richardson, John Bosma, Sven Roosild, and Diane Larriva, *A Review of the Technology Reinvestment Program*, PIPS 99-1 (Arlington, VA: Potomac Institute for Policy Studies, January 30, 1999). For the history and politics of the TRP one of the best sources is Jay Stowsky, "The History and Politics of the Pentagon's Dual-Use Strategy," in Anne Markusen and Sean Costigan, eds., *Arming the Future: A Defense Industry for the 21st Century* (New York: Council on Foreign Relations Press, 1999): 106-57.

Finally, the rapid consolidation of the American defense industry can be partially attributed to conscious policy decisions since 1993 in the DoD. The US Government made it clear that it would use federal funds to promote the rationalization of the industry through a series of mergers to create giant corporations.[14]

Chart 1[15]



In this context, the high-technology policy developments in the US combined with the emphasis on "economic security" in defining American national security priorities[16] forced Europeans to rethink and adjust their industrial and technological goals as well as the most appropriate means for achieving them. As a result, by the mid-1990s Europe's political-industrial circles began to articulate with clarity a new "American technological threat," and this fear lead to the emergence of "anti-US sentiments," especially in the European aerospace industry.[17]

For example, in 1994 the influential French defense analyst Yves Boyer suggested that since the late 1980s the US had begun to promote a "new international order" in which advances in high-technology functioned as instruments to achieving economic and military dominance. Furthermore, he contended that after winning the Cold War, America and its defense companies had launched a new "economic war" against Europe, which is fought through R&D budgets, particularly in the "dual-use" high-technology sectors (see Chart 2 for the aerospace sector).[18]

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[14] John Dowdy, "Winners and Losers in the Arms Industry Downturn," *Foreign Policy*, no. 107 (Summer 1997): 88-103.

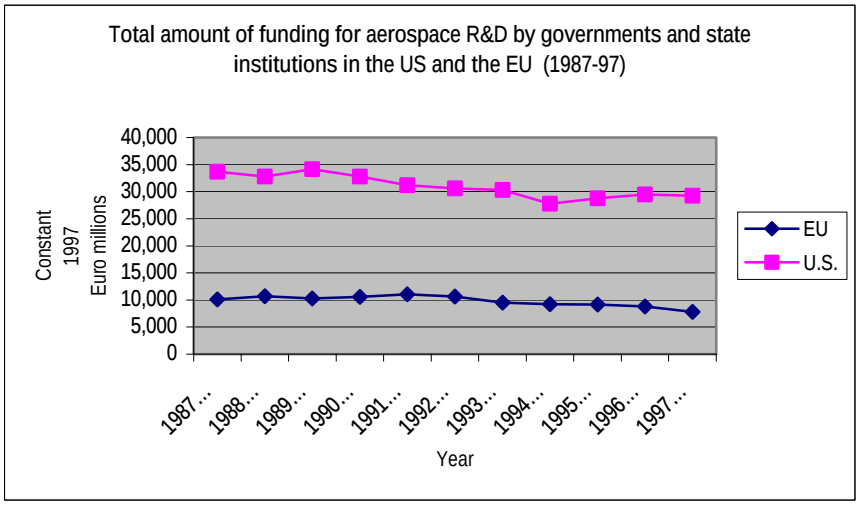
[15] Source: *US National Science Foundation*. Data (accessed on December 20, 2002) from http://www.nsf.gov/sbe/srs/nsf00303/tables/table3.xls.

[16] Warren Christopher, then US Secretary of State, "The Strategic Priorities of American Foreign Policy," *Statement before the Senate Foreign Relations Committee*, Washington, D.C., November 4, 1993, US Department of State Dispatch 4, no. 47 (November 22, 1993).

[17] Nick Cook, "Battle for Europe's hearts and minds," *Interavia Business & Technology* (September 1997).

[18] Yves Boyer, "Technologies, défense et relations transatlantiques," *Politique étrangère* 59, no. 4 (Winter 1994/95): 1006-15.

Chart 2[19]



At the same time, representative German aerospace industrialists also began to voice concern about their country's ability to maintain a competitive position in high-technology industries.[20] Finally, by 1999, two reputable French observers concluded that the Clinton Administration's technology policy and its aggressive arms exports policy were key elements in securing the "hegemony" of American defense firms in their competition with the European defense electronics and aerospace firms.[21]

At this point a caveat is necessary. If in the American context "economic security" has both military and defense-industrial implications,[22] European states have traditionally perceived such a term as having primarily civilian and economic connotations.[23] However, since the late 1980s, due to the realization that technological innovation was increasingly being driven from the commercial side and that it had to be integrated into military systems, defense industrial issues were perceived for the first time as having an impact on the EU's technological competitiveness and, thus, on its "economic security."

Moreover, due to its enabling strategic capabilities, the aerospace industry has been always regarded in Europe as a highly symbolic sector. Thus, in post-Cold War Europe "economic security" has become increasingly equated with the technological competitiveness of national firms in both the civilian and military markets.

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[19] Data adapted from Data-Table 2.1.1-1a, available in Hans-Henrich Altfeld, ed., *Government Funding for Aerospace: A comparative analysis of government expenditure for aerospace in the EU and the US* (Brussels: European Association of Aerospace Industries, July 2000): 124.

[20] Hartwig Knitter, "Hochtechnologie -- Sicherung des Industriestandortes Deutschland?," in *Dokumente der Luft- und Raumfahrtindustrie*, no. 9 (Munich: Daimler-Benz Aerospace A.G., 1994). Knitter was then member of the Board of Directors at DASA, responsible for Personnel Management.

[21] Jean-Paul Hébert and Laurence Nardon, *Concentration des industries d'armement américaines: modèle ou menace?*, in Cahier d'Etudes Stratégiques 23 (Paris: Centre Interdisciplinaire de Recherches sur la Paix et d'Etudes Stratégique, École des Hautes Études en Sciences Sociales, 1999): 79-102.

[22] Martin Libicki, *What Makes Industries Strategic*, McNair Paper 5 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, November 1989).

[23] Jens van Scherpenberg, "Transatlantic competition and European defence industries: a new look at the trade-defence linkage", *International Affairs* 73, no.1 (January 1997): 100.

"Lessons learned" from the evolution of Airbus in 1987-99

One should perceive Airbus, at the most fundamental level, as a sophisticated -- yet essentially mercantilist – strategic instrument forged by European states and industrial interests in response to a challenge embodied in the US dominance of the post-World War II aerospace industry.[24] This being said one should recall that the Airbus "offensive" against the American aircraft manufacturers (Boeing, McDonnell-Douglas, and Lockheed) began with the launch of the A320 model in February 1987, and "its aggressive exploitation of the changing environment only exacerbated the problems confronting the heretofore dominant American industry."[25]

The Gulf War of 1990-91 provided then an eloquent illustration of air power and the value of power projection capabilities, high-technology airborne weapons, and support systems. It confirmed also to Europeans that probably the most compelling "externality" justifying the possession of independent industrial capability was still the contribution aerospace makes to national security. Thus, since the early 1990s, an independent aerospace capability has been perceived as having a key role in European industrial and technological development and it has begun to be closely associated with concepts of European security and political autonomy. [26]

The American victory in the Gulf War of 1990-91 only highlighted a paradoxical situation in which leading Western European governments and business leaders perceived themselves and the US during the last days of the Cold War. In assuring its own ability to guarantee the security of NATO, the US threatened to relegate its allies to a position of perpetual economic and political subordination. As such, one European response involved rationalizing and strengthening national capacities across a broad range of industrial sectors and aerospace assumed a central place in these adaptive strategies. Moreover, European leaders

> realized that national efforts alone would remain inadequate to the challenge posed by the volume of U.S. resources and the continental scale of U.S. market. In hopes to reestablish their position in this high technology industry, the Europeans undertook the daunting challenge of international collaboration.[27]

Finally, European reactions to the 1996 Boeing-McDonnell Douglas (MDD) merger indicated that some analysts discerned issues related to industrial and technological sovereignty that placed into question the preferences of European political and industrial elites regarding the post-Cold War transatlantic relationship.[28]

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[24] Bill Gunston, *Airbus* (London: Osprey Publishing Ltd., 1988); and Keith Hayward, "Airbus: twenty years of European collaboration," *International Affairs* 64, no. 1 (Winter 1987/88): 11-26.

[25] Steven McGuire, *Airbus Industrie: Conflict and Cooperation in US-EC Trade Relations* (New York: St. Martin's Press, 1997): 42.

[26] Manfred Bischoff, *The Future of the European Aerospace Industry*. Speech held at a Symposium of the European Parliament and the European Commission in Brussels on November 5, 1996. Available in Dokumente der Luft- und Raumfahrtindustrie, no. 14 (Munich: Daimler-Benz Aerospace A.G., 1996).

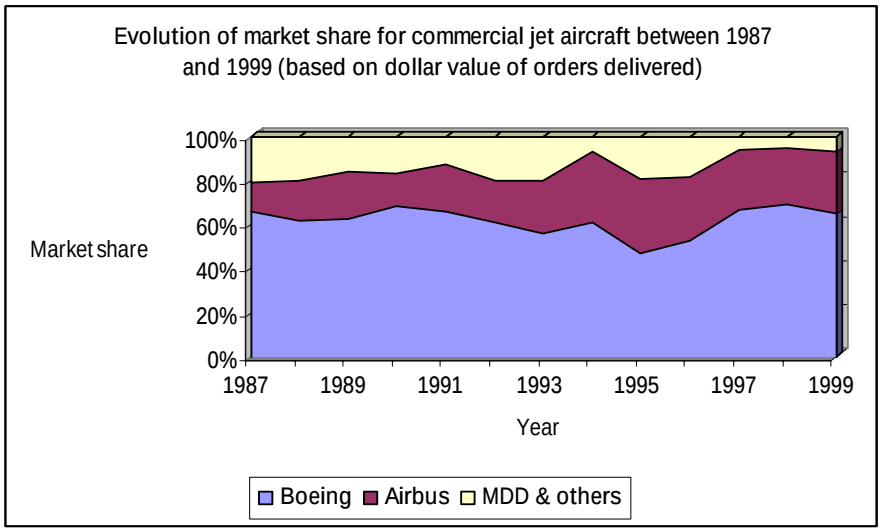
[27] David Weldon Thornton, *Airbus Industrie: The Politics of an International Collaboration* (New York: St. Martin's Press, 1995): 2.

[28] Yves Belanger and Laurent Carroué, *American offensive for control of the skies*, Le Monde diplomatique, Web English edition (September 1997), translated by Sally Blaxland. Article (accessed on January 20, 2003) from http://mondediplo.com/1997/09/boeing.

One other element is noteworthy: Martin Bangemann – while the EU Commissioner for Industrial Affairs -- advocated in the late 1980s and early 1990s that the industrial policy promoted by the European Commission must not only strengthen the competitive ability of EU industry but also defend it against dominating competition. He considered competition polices (primarily passive – they remove barriers to competition) and industrial policies (active – they create competition) complementary because one has to first a create competition before one can survive on its own in the global market.[29]

This perspective led Thomas Duesterberg to write in 1993 that "European efforts that Bangemann uses to illustrate his vision of a 'pro-competitive' industrial policy are symbolized by the Airbus program, a quintessential case study in which the EC [European Community] used its financial muscle to 'create competitors' against 'dominating' outside competition."[30] In this context, Airbus may well also indicate that since the late 1980s the European Commission has begun explicitly to define and implement industrial policy, particularly for high-technology sectors. This often translated into greater subsidies for emerging high-technology industries as well as financial support for R&D.[31] Moreover, the second round of "the Airbus-Boeing subsidies battle" that took place during the late 1980s and early 1990s must be also recalled because it highlighted "that fears of decline seem to have coloured European attitudes toward the international trade regime."[32]

Chart 3[33]



The success of such approaches with regard to the EU's industrial policies can be easily judged by looking in particular at the changes in the world commercial jet-airliner market between 1987 and 1999. One can conclude that it helped the EU to maintain a world-class aeronautical

[29] Martin Bangemann, *Les clés de la politique industrielle en Europe* (Paris: Les Éditions d'Organisation, 1992).
[30] Thomas Duesterberg, "Global Competitiveness and U.S.-EC Trade Relations," *The Washington Quarterly* 16, no. 3 (Summer 1993): 121.
[31] Margaret Sharp and Keith Pavitt, "Technology policy in the 1990s: old trends and new realities," *Journal of Common Market Studies* 31, no. 2 (June 1993): 135.
[32] McGuire, op. cit. (1997): 13. However, it must be emphasized that *Airbus Industrie's* success during the late 1990s was not due to winning the subsidy competition.
[33] MDD is included in Boeing's figures after 1997. Data from *The Airline Monitor* 15, no. 12 (May 2003): 24-5.

industry and, as Chart 3 indicates, there is little dispute about the success of Airbus in the market. Between 1987 and 1999 it became the world's second-largest commercial aircraft manufacturer. Its success was perceived as crucial to the European Commission because, since the mid-1980s a number of ventures were designed to create competitive high-technology industries in the EU, yet none of them has done as well as Airbus.

From a complementary perspective, taking into account that "the civil-aircraft industry is the most politicised in the world--apart from the defence industry, to which it is joined at the hip,"[34] from the viewpoint of business-government relations there are also some important lessons to be learned.

First, the commercial success of Airbus highlights that EU governments, the European Commission, and industrial interests are able to successfully engage in sustained collaboration in creating an effective instrument of commercial strategy in certain high-technology sectors (even if a decade or more is required for success), which in the end, due to its "dual-use" applications will also affect the attitudes of the major players in the global defense market. Cross-border cooperation at both the firm level and inter-governmental level has been essential to Airbus's success, with the partners progressively integrating the production process as they have learned to cooperate and have developed trust in each other. This dynamic cooperation led Bangemann to describe Airbus as "the model" for European industrial cooperation.[35]

Second, the perceived threat posed by the 1996 Boeing-MDD merger[36] persuaded Airbus's shareholders[37] to sign in January 1997 a Memorandum of Understanding that proposed the restructuring of Airbus into a limited liability company -- a single corporate entity -- by 1999. Moreover, in March 1998, they recognized that "the prosperity of their business depends critically on a thorough integration and restructuring of the aerospace and related defense industries in Europe." They accordingly agreed to negotiate the establishment of

> a single integrated European Aerospace and Defence Company (EADC), merging all relevant assets, with core businesses in the fields of civil and military transport aircraft, combat and special military mission aircraft, helicopters, space launchers and orbital infrastructures, guided weapons, and defense and aerospace systems.[38]

But most importantly, the Boeing-MDD move convinced key European political and industrial leaders that without the creation of a truly functional European market the concept of a

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[34] "Peace in our time," *The Economist* , July 26, 1997.

[35] As quoted in Hayward, op. cit (1994): 63.

[36] Jean Pierrson, "Une fusion pour tuer Airbus," *Le Monde*, June 14, 1997. Pierson was then the Chairman & CEO of *Airbus Industrie*.

[37] The evolution of shareholders structure: December 1970 -- *Airbus Industrie* formed (Aerospatiale 50%; DASA 50%); October 1971 -- CASA joined *Airbus Industrie* (Aerospatiale 47.9%; DASA 47.9%; CASA 4.2%); and, December 1979 -- British Aerospace joined *Airbus Industrie* (Aerospatiale 37.9%; DASA 37.9%; BAe 20%; CASA 4.2%). After the creation of EADS and BAE Systems in 1999 there are only two shareholders: EADS (80%) and BAE Systems (20%).

[38] Joint report of Aerospatiale S.A., British Aerospace plc, Construcciones Aeronauticas S.A, Daimler-Benz Aerospace AG, *European restructuring in the field of aerospace and related defence industries: Industrial response to the inter-governmental declaration of 9 December 1997* (March 27, 1998): 3.

"European aerospace industry" is meaningless. Taking into account the global context of the aerospace sector, the only European aerospace market that could be envisaged was the defense market.[39]

Against this background, the creation of EADS in 1999 endorses also the conclusion that continental Europeans began to fully understand that in the strategic high-technology industries, mergers also decide whether a nation, or an integrated bloc of nations like the EU, maintains the industrial and economic guarantees of sovereignty. Sovereignty requires a competitive industrial base, and low levels of technology dependence ensure a higher level of independence in policy-making.

Key European initiatives related to the development of an independent global navigation satellite system (GNSS) during the 1990s

NATO's Kosovo air campaign in March-June 1999 made it clear to European elites that the prerequisite for greater independence in security policy is improved technological capability. It was also immediately recognized, especially in France, that navigation systems were an area of great concern, where immediate action was required.[40]

Against this background, the EU officially decided in 1999 to challenge the already existing American GPS by launching "Galileo" – the independent satellite constellation which has sparked considerable transatlantic discord ever since. It is widely considered among Europeans that after Airbus and the Arianespace project, Galileo is the third common project that aims to secure the EU against overdependence on US strategic air and space technology.[41]

Structured European efforts to reduce dependence on the American GPS system, however, have been clearly identifiable since the mid-1990s. They were primarily driven by the perception that since the end of the Cold War the United States was increasingly employing space systems as an instrument for strengthening its political, technological, and economic dominance.[42]

In this setting, throughout the 1990s three European organizations cooperated closely to pursue the goal of European autonomy in satellite navigation systems: the European Space Agency (ESA), Eurocontrol (the organization responsible for coordinating air traffic control), and the Directorate General for Transport and Energy of the European Commission (DG TREN). However, in the absence of an integrated institutional arrangement for the space sector the European Commission seized the opportunity to assert its control and influence and become the leading player. According to an ESA official, this was a natural evolution, because

> In principle, satellite navigation should be similar to the development of Airbus or Ariane where you needed a few good and strong promoters. However, given the

[39] Author's interview in Ottobrun (Germany), October 22, 2002.
[40] Christophe Allemand, "Galileo joins Gness and Glonass," *Cnes Magazine*, English edition, no. 6 (June 1999): 15. Allemand was then Galileo Project Manager at the French Space Agency.
[41] Jost Vielhaber and Daniel Sattler, "Why Europe needs Galileo," *Internationale Politik – Transatlantic Edition* 3, no.4 (Winter 2002): 35.
[42] *Towards a Space Agency for the European Union*, Report by Carl Bildt, Jean Peyrelevade, Lothar Späth to the ESA Director General (Paris: European Space Agency, November 9, 2000): 3.

> political (strategic/military) dimension people felt quite strongly right from the beginning that it had to be integrated into the larger European context, that is, the EU.[43]

Moreover, the development of the program within an EU institutional framework was probably also envisaged to enhance the EU's strategic bargaining power in the context of future international negotiations (especially with the US).

Several official documents in 1994-99 signaled the EU's preferences for developing an autonomous satellite navigation system and highlighted its dissatisfaction with regard to its strategic dependence on US space capabilities. First, in June 1994 the European Commission contended that:

> If Europe does not act promptly then the control of the entire system will be done from overseas by implementing a civil American complement to the military GPS system. Those who will own and operate the upgraded system will set user requirement standards and certification schemes for the equipment. The result would be a major dependence of Europe on the provision of a strategic asset for the future and a poor perspective for its industry to capture the huge associated market for user equipment.[44]

During the same time (1994-95), a High Level Industry Working Group (HLIWG), which included representatives of the European space industry, worked under the Chairmanship of Michel Delaye, then the Director of Aerospatiale's Space and Defense branch, on an assessment of the development and competitiveness of the European space sector. With regard to the GNSS sector the final report of the HLIWG submitted to the EU Commission in January 1996 concluded that

> It was totally absent from this major application at the space sector level and only marginally involved in terminals due to advances achieved by American industry in its military and civilian markets. The European space industry could simply be eliminated as a supplier of the future international system.[45]

The report also called for the creation of a European Agency for Navigation to strengthen the EU's independent political position and to safeguard its commercial interests.[46] The document provided political support for the Commission and greatly influenced the text that it adopted on December 4, 1996: *The European Union and space: fostering applications, markets and industrial competitiveness*. The Commission considered that if the EU was not to be left hopelessly behind on the very promising markets arising from the new space applications -- satellite

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[43] Interview of Johan Lembke with an ESA official on October 23, 2000. As quoted in Johann Lembke, *Defining the New Economy in Europe – A Comparative Analysis of EU Technology Infrastructure Policy, 1995-2001*, Stockholm Studies in Politics 86 (PhD dissertation, Stockholm University, 2002): 115.

[44] European Commission, *Satellite navigation services: a European approach*, COM (94) 24 (Brussels, 1994): 11.

[45] *Development and competitiveness of space industries in Europe*, Report of the Industry's High Level Group to the European Commission (Brussels, January 30, 1996): 22.

[46] Ibid., 22-3.

telecommunications, satellite navigation, and earth observation -- Europe must immediately provide an appropriate strategic response.[47]

By 1996 it was widely accepted among ESA officials that "Europe should take the initiative to balance the US ambition to promote worldwide acceptance of GPS for civil applications" because this "will give Europe independence from foreign national/military satellite systems and control over its own element within a global civil navigation satellite system."[48]

On January 21, 1998 the European Commission issued a document which indicated that "GNSS represents a strategic challenge impacting on Europe's position in the world," and that foreign control over Europe's navigation systems would raise "serious problems for both sovereignty and security." Finally, while recognizing GNSS "as a significant opportunity for the EU space and high-technology industries and … its potential dual civil/military use," it stressed that the EU needed to develop a GNSS-2 (the next generation of GNSS) strategy to ensure that it would play a full role in the future of satellite navigation.[49]

In June 1998, Eurospace (The Association of European Space Industry) completed an analysis (commissioned by ESA) related to Europe's strategic dependence in space technology:

> In the short term, the existence of a world satellite navigation monopoly is liable to create a strategic dependence relationship in a substantial number of domains associated with national sovereignty. The evolution of the current American system, as also the existence of eventual alternatives, must be examined at political level. If not, the risk exists of a progressive loss of control of a technological resource which is essential in connection with the new international relations.[50]

Against this background, in early 1999, the EU Commission provided a refined review of available strategy options, which spoke about a full role for the EU in the development of the next generation of GNSS and mentioned the great opportunity in the navigation market. The document also gave the system its name – "Galileo."[51] In July 1999, the EU Transport Council decided that the EU could move ahead with plans to build its own global satellite navigation system.[52]

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[47] European Commission, *The European Union and space: fostering applications, markets and industrial competitiveness*, COM (96) 617 (Brussels, December 4, 1996).

[48] Karin Barbance, Karl Bergquist, Simonetta Cheli, Valerie Hood, and Frederic Nordlund, "Satellite navigation activities: The international context," *Space Communications* 14, no. 3 (1996). Accessed via the EBSCO database. The authors where then all working in ESA's international affairs department.

[49] European Commission, *Towards a 'Trans-European' positioning and navigation network: A European strategy for global navigation satellite systems*, COM (1998) 29 (Brussels, January 21, 1998).

[50] Eurospace, *European strategic dependence as relating to space technology,* ESA order no. 97 0856 (Paris: Eurospace, June 1998): 37.

[51] European Commission, *Galileo: Involving Europe in a new generation of satellite navigation services*, COM (1999) 54 (Brussels, February 10, 1999).

[52] European Commission, *Galileo: Global satellite navigation services for Europe*, Communication for the Meeting of the Council of EU Ministers for Transport (Luxembourg, June 17, 1999); and, European Council, *Council Resolution of 19 July 1999 on the involvement of Europe in a new generation of satellite navigation services – Galileo definition-phase*, 1999/C 221/01 (Luxembourg: Official Journal of the European Communities, August 3, 1999).

Commercial and industrial considerations behind the Galileo project during the 1990s

After the decisions of the US government to make GPS data available to civilian users in the early and mid-1990s, European political and industrial elites quickly understood the opportunity to engage in a race for market share and to enhance strategic independence. Their interest in doing so was reinforced by various studies that forecast that very promising markets would arise from new commercial space applications, including satellite navigation. Furthermore, these studies also provided a strong incentive to propose an autonomous system that would attract investments from the European industry.[53] Moreover, by the mid-1990s, European firms appeared also to be concerned that the massive legal presence of US firms in the GPS-related services market was providing a considerable advantage to American firms.[54]

In this context, the emergence of a project which offered the prospect of multi-billion dollar benefits also offered an unexpected window of opportunity for the European space industries, which *de facto* had no presence in the satellite navigation business during the 1990s. As an official from Alenia admitted in November 2000:

> Presently in Europe, no industry for satellite navigation really exists. In other words, space-based navigation depends on the US GPS constellation. From an industry perspective, thus, it is a wholly US industry. A real industry has not yet been implemented in Europe. This is the purpose of the Galileo project. … The benefits are mainly political, to catalyze political forces and to take decisions in order to proceed with a multi billion dollar project. For the EC, this is extremely important.[55]

Finally, both ESA and the national space agencies were frustrated by the fact that the EU lacked large scale space projects due to insufficient allocations of funds. European industry representatives requested decisive political action at the EU level to develop a coherent space policy that could provide the much needed financial support for any important space project.[56]

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[53] For some estimates during the 1990s see, see for example, a) US National Academy of Public Administration and the US National Research Council, *The Global Positioning System: Charting the Future*, Report for the U.S. Congress and the Department of Defense (Washington, DC: May 1995). Document (accessed on April 14, 2003) from http://www.navcen.uscg.gov/pubs/gps/gpsfuture/charting.htm; b) European Commission, *The European Union and space: fostering applications, markets and industrial competitiveness*, COM (96) 617 (Brussels, December 4, 1996): 14; and c) European Commission, *Galileo: Global Satellite Navigation Services for Europe*, Communication for the Meeting of the Council of EU Ministers fro Transport (Luxembourg, June 17, 1999): 6.

[54] Xavier Pasco, *Galileo: A Cornerstone of the European Space Effort*, Occasional Paper (Washington, D.C.: Eisenhower Institute, May 2002). Accessed (on October 27, 2002) from http://www.eisenhowerinstitute.org/commentary/paper1.htm.

[55] Interview of Johan Lembke with the Alenia official on November 16, 2000. As quoted in Lembke, op. cit. (PhD dissertation, 2002): 131.

[56] See, for example, Klaus-Peter Ludwig and Stefan Hess, "Toward a European Space Policy," *Internationale Politik – Transatlantic Edition* 1, no. 2 (Summer 2000). Article (accessed on May 29, 2001) from http://www.dgap.org/english/tip/tip2/eurospace_p.html. Ludwig headed then the international relations section of Dornier Satellite Systems and Hess was leading the Space Department of the German Association of Aerospace Industries.

Galileo and the EU's military and security considerations during the 1990s

The 1990s witnessed a conscious and deliberate effort by European decision-makers to promote and legitimize the development of an autonomous GNSS as a purely civilian project. Furthermore, the preferences of the European defense ministries and military agencies remained largely hidden from the public debate. However, although only after 2000-01 did Europeans begin to bluntly express the need for Galileo in military and security terms, there is evidence that also during the 1990s similar considerations played a role in advancing the project's agenda.

The French government, in particular, promoted Galileo's military security role and, thus, it was engaged in long-term and detailed analyses, including the issues of potential military requirements and obligations toward NATO.[57] At this point one must mention that also other European governments (Austria, Belgium, Italy, Spain, and Switzerland)[58] shared French views to a large extent and, thus, perceived the GNSS as a *grand projet* (i.e., a public-oriented initiative similar to Airbus, with a clear political and strategic goal rather than an exclusively commercial enterprise). Denmark, Germany, the Netherlands, and the UK stressed the exclusive commercial interpretation to the project, and expressed opposition to the inclusion of military user requirements.[59] Finally, Finland, Norway,[60] and Sweden expressed a great interest in developing Galileo within a well defined and comprehensive security framework.[61]

In this context, one should not be surprised to learn that there were also people in the European Commission who were interested in the military and security applications of Galileo. As long ago as 1995 a former French prime Minister, Edith Cresson, then serving as the EU Commissioner responsible for Research and Development, indicated that space represents a key element for Europe's economic security.[62] During the 1990s, DG TREN and DG Research tried not to miss any opportunity to further incorporate foreign policy and security issues within the jurisdiction of the European Commission by linking economic and security considerations and, thus, actively promoted the participation of military representatives in the consultation process. [63]

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[57] David Yost, *France and the Revolution in Military Affairs*, unpublished paper (draft of March 31, 1997): 63.

[58] Switzerland is not member of the EU, but is an ESA member country.

[59] It must be also mentioned that the motives of many Galileo partners were not exclusively strategic but also the result of budgetary or bureaucratic circumstance: for instance, the UK would most probably not have joined a project so firmly opposed by the Pentagon (Office of Secretary of Defense) if it had been presented by France or other countries as a strategic venture with a security dimension undertaken by defense departments. Conversely, various European departments of transportation or of research had the problem of not losing space money initially dedicated to ESA's slow-moving International Space Station; Galileo was a way of spending that money. I am grateful to Dr. François Heisbourg for this observation.

[60] Norway is not part of the EU, but it is a member of ESA (and NATO).

[61] Johan Lembke: a) *Politics of Galileo*, European Policy Paper 7 (Pittsburgh: EU Center/Center for West European Studies, University of Pittsburgh, April 2001): 10-1 and 16; and, b) *EU Strategic Independence and Transatlantic Interdependence: The Political Economy and Security of Satellite Navigation and Positioning*, paper presented at the 13th International Conference of Europeanists (Chicago, March 14-16, 2002): 12-3.

[62] As reported in Simonetta Cheli, "The European Union and Space," *European Center for Space Law Bulletin No. 16* (Paris: European Space Agency, May 1996). Text (accessed on July 20, 2003) from http://esapub.esrin.esa.it/ecsl/ecsl16/cheli16.htm.

[63] During the late 1990s, "Military authorities within the EU Member States have taken part in planning discussions about Galileo at different levels, including at the highest level in working groups of the EU Galileo Steering Committee (the executive body that is chaired by the European Commission and that consists of EU government representatives). The military have been particularly influential in the larger EU Member States." Lembke, op. cit. (2001): 16-7. The

Between July and December 1998, military representatives participated in a working group on the civilian-military interface and military requirements under the "GNSS-2 Forum" exercise, which was headed by the European Commission.[64] In October 1998, Neil Kinnock, the then-EU Commissioner for Transportation, pointed out to the linkage between satellite navigation and European security needs:

> Finally, there are security and sovereignty arguments that must be impressed upon decision and policymakers by inviting them to consider the reality that, within 10 years, all of Europe's safety critical transport activities could well be reliant on a system that is not within European control. No one has to be a devotee of fortress Europe or Euronationalist to recognize the disadvantages and hazards of that – and apart from the functional, industrial and employment arguments – that basic consideration should be enough by itself to impel the necessary policies.[65]

These developments led NATO officials to invite the European Commission in March 1999 to make an informal presentation about its work on developing an autonomous GNSS. Luc Tytgat, a senior policy adviser within DG TREN who played an important role in the development of Galileo, noted that within the treaties founding the EU include a provision for creating a common foreign and security policy and that this could provide the "starting point to incorporate the security aspects of Galileo." While not disregarding the fact that with the creation of a new constellation, the EU will have a system with military applications, much like those of GPS, he also pointed out that the European Commission was exploring the possibility of entrusting the WEU with the security aspects of Galileo.[66]

In summary, during the 1990s, European elites devoted a lot of energy to promoting the development of an autonomous GNSS. The fact that active discussions took place and that relevant policy initiatives were implemented in 1994-99 spurred a new dynamic. First, Galileo is a project with evident overlapping geo-economic and strategic implications that underscores the EU's desire for a distinct and assertive voice in key international policy areas. Second, and probably most importantly, the developments in Europe since the 1990s in satellite navigation have begun to increasingly provide the European elites with a kind of leverage *vis-à-vis* the US that they did not previously have.

WEU did not have any permanent representative in the Galileo committee, but people from national defense ministries or agencies were occasionally called to attend the meetings. See Lembke, op. cit. (PhD dissertation, 2002): 137.

[64] The *GNSS-2 Forum* aimed to address all GNSS-2 related issues, paving the ground for the Communication of the Commission. It met for the first time on July 24, 1998 and was co-chaired by DG TREN and DG Information Society. It then split into four working groups respectively dealing with the institutional framework, technical and financial issues, security issues, and users and services requirements. The Forum held its closing plenary on December 2, 1998. The recommendations which were produced on each domain paved the way for the already mentioned European Commission communication: *Galileo: Involving Europe in a new generation of satellite navigation services*, COM (1999) 54 (Brussels, February 10, 1999).

[65] Neil Kinnock, *European Strategy for GNSS*, speech at the GNSS 98 Symposium organized by CNES and the European Group of Institutes of Navigation (Toulouse, October 20, 1998).

[66] Dee Ann Divis, "More on Galileo: EU Takes Its Plan to NATO, Western European Union," *GPS World* (May 1, 1999): 14-9.

Considerations about the European response towards the US-led RMA during the 1990s

Among the many issues connected with developing an overall US strategy for the RMA, one that deserves particular attention is the role and the reactions of key European allies with regard to this strategy.[67] As Andrew Krepinevich pointed out as long ago as 1992 in a report for the Office of Net Assessment (US DoD):

> Do we wish to develop the next generation military capabilities jointly with our allies, or do we hope to maintain some margin of advantage over all other countries? Do we envision coalition warfare in which our friends are as capable as ourselves? Or in which we provide certain kinds of military services or functions that our friends lack? Do we attempt to discourage first-rate military technical competitors by sharing capabilities and winning trust, "lending" capabilities and building dependence, or maintaining superior capabilities and building entry barriers? Will "natural," economic limitations on what our allies can do make these issues moot (by making some advanced capabilities unaffordable to them) or make these issues more delicate (by making their capabilities more clearly dependent on our willingness to share)?[68]

During the 1990s continental Europe was, generally speaking, reluctant to fully exploit the advantages offered by the information revolution. The military-technological revolution did not mean much for European political and military elites who were skeptical about the benefits of pursuing "an American-style RMA." It was considered that things were not going to work as well as advertised on the technological side and that the changes were too expensive. Thus, the concepts and systems associated with the RMA of the 1990s seemed of no great importance to European decision-makers and consequently did not receive a systematic and structured approach (i.e., strategy, force structure, industrial base, etc.). The "wake up" call came in Europe only after NATO's 1999 "Operation Allied Force."[69]

However, the leading European military-industrial powers were interested during the 1990s in at least some of the advanced technologies associated with the RMA.[70] In general, as an analysis commissioned by the Konrad Adenauer Foundation indicates, post-Cold War asymmetries in strategy between the transatlantic partners were generally employed before the 1999 Kosovo air war to justify their reluctance *vis-à-vis* the RMA.[71]

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[67] Without attempting here to choose between conflicting definitions or to offer yet another definition, this section will consider that the RMA debate is in many ways a response to the end of the Cold War, providing a new paradigm for US defense and security policy -- giving direction about priorities: what types of military forces, technological capabilities, and organizational structures are needed for the conflicts of the future.

[68] Andrew Krepinevich, *The Military-Technical Revolution: A Preliminary Assessment* (July 1992): 54. The report was prepared for the Office of Net Assessment and it explored whether or not a major shift of military warfare was underway. Text (accessed on November 10, 2002) from http://www.csbaonline.org/4Publications/Archive/R.20021002.MTR/R.20021002.MTR.pdf.

[69] This paragraph draws on author's interviews in Paris, Sankt Augustin (Germany), Bonn, Berlin, and Brussels in May-September 2002.

[70] Lawrence Friedman, *The Revolution in Strategic Affairs*, Adelphi Paper 318 (Oxford: Oxford University Press for the International Institute for Strategic Studies, April 1998): 75-6.

[71] Robert Grant, *The Revolution in Military Affairs and European Defense Cooperation*, Arbeitspapier (Sankt Augustin: Konrad Adenauer Stiftung, June 1998): 20. However, it must be said that economic-industrial considerations played

French views of the US-promoted RMA during the 1990s

Before the Kosovo war of 1999, skeptics, proponents, and those favoring a French-style RMA came to different conclusions on what the concept meant for France (and Europe) and whether the concept should guide France's (and Europe's) defense modernization efforts after the end of the Cold War.

The skeptics primarily argued that French (and European) defense and security interests were not identical to those of America; and that the US RMA related discourse should be regarded primarily as an attempt by the powerful arms industry to sell, in the context of the post-Cold War defense budgets cuts, a new concept to US policymakers and legislators.[72] Furthermore, the same French circles perceived the RMA as an American instrument of global hegemony and, thus, initiated and actively contributed to a debate about the real motivations of France's "hegemonic" ally to pursue the military-technological revolution during the 1990s. According to Alain Joxe,

> The maintenance of the hierarchy of nations for the benefit of United States leadership presupposes explicit action to slow down the acquisition of technologies by other industrial countries. The Atlantic Alliance was established to with the primary goal to counter the expansionist power of the USSR, and only secondarily to maintain the leadership of the United States over its allies. The RMA aims only at hierarchization, the peer competitor potentially more capable of emerging from within the Alliance than outside it. In this precise sense, what was an alliance is becoming literally an imperial structure.[73]

The French reservations about the RMA must be also interpreted in the broader context of the 1990s when French elites struggled to address the challenges posed by the globalization process and the information technology revolution in order maintain France's (and Europe's) competitiveness in key sectors of the global economy.[74] For Europe in the 1990s the RMA was

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also a great role in European reluctance to actively pursue a US-style RMA. Asymmetries in industry, market structure and dynamics as well as in technology development and its application towards the U.S. seemed to have discouraged Europeans from truly embracing the RMA-related concepts and systems. See, for example, Rachel Bronson and Daniel Gouré, "The Diplomatic Consequences of the Coming RMA," *Foreign Service Journal* (September 1998): 24-33; and, David Gompert, Richard Kugler, and Martin Libicki, *Mind the Gap: Promoting a Transatlantic Revolution in Military Affairs* (Washington, D.C.: National Defense University Press, March 1999): 65-79.

[72] Since the mid-1990s, the RMA received very critical evaluations especially from the *Groupe de Sociologie de la Défense* (later on, the *Centre Interdisciplinaire de Recherches sur la Paix et d'Etudes Stratégiques*) affiliated with the Paris-based *École des Hautes Études en Sciences Sociales* which publishes the journal *Cahier d'Etudes Stratégiques*. The Director of this think thank is (and was also during the 1990s) Alain Joxe, the brother of the former French Defense Minister Pierre Joxe. Among the critical works related to the US-led RMA one should mention: Alain Joxe, ed., "Le débat stratégique américain 1994-95: Révolution dans les affaires militaires?," in *Cahier d'Etudes Stratégiques No. 18* (Paris: Groupe de Sociologie de la Défense, École des Hautes Études en Sciences Sociales, 1995); and, Saïda Bédar and Maurice Ronai, eds., "Le débat stratégique américain, 1998-99: Défis asymétriques stratégiques et projection de puissance," *Cahier d'Etudes Stratégiques No. 25* (Paris: Centre Interdisciplinaire de Recherches sur la Paix et d'Etudes Stratégiques, École des Hautes Études en Sciences Sociales, 1999).

[73] Author's translation. In Alain Joxe, "État des lieux de la RAM (révolution dans les affaires militaires) deux antinomies structurelles en limitent l'efficacité stratégique," *L'Armement*, no. 51 (March 1996): 141.

[74] Élie Cohen, *La tentation hexagonale: La souveraineté à l'épreuve de la mondialisation* (Paris: Fayard, 1996); and, Frédérique Sachwald, *L'Europe et la mondialisation* (Paris: Flammarion, 1997).

also part of a broader transformation challenge for its social and economic model of development.[75]

Among the RMA proponents, Patrick Bratton points to a group of young French officers (mostly in the Air Force and the Navy) who since the early 1990s channeled their efforts to move French strategic thinking beyond the (somewhat outdated) concept of nuclear deterrence. They urged a redefinition of France's interests in the context of the redefined relationship between technology, the new post-Cold War international order, and the future of warfare. They advocated a new French defense policy with emphasis on power projection, military intervention, and increased use of advances in intelligence gathering and electronic warfare.[76]

Between the *jeune école* and the skeptics, there is yet another group, consisting of academics, military officers, and *Ingénieurs Généraux de l'Armement*[77] investigated in detail aspects of military-technical innovation and future military strategies and organizations. They attempted to assess whether and how some of these concepts could lead to a French-tailored RMA. Among those, one should primarily point to the works of Paul-Yvan de Saint-Germain, who argued in several articles during the 1990s that the RMA must be the object of responsible debate and that concepts associated with the military-technological revolution promoted in the U.S. should also provide the guiding principle for French military modernization.[78]

A somewhat complementary view was promoted by Laurent Murawiec. He was convinced in 1998 that the RMA was going to have a considerable impact, and recommended that France not fail to capitalize on its implications. The analyst also predicted that war would inevitably extend to space and, thus, the control of satellite-dependent civilian and military telecommunications would be vital. In addition to detailing what the RMA was Muraviec advanced arguments concerning what it was not. He noted that while the revolution was a form of dissuasion, it would not lead to the obsolescence of nuclear arms.

Moreover, he made the point that the US-led RMA was not: a) a conspiracy of American companies to outclass their European competitors; b) a pretext to obtain public funds to support the US defense industry; c) reappearance of the Strategic Defense Initiative; or d) an American attempt to impose its strategies and techniques on their allies.[79]

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[75] Robbin Laird and Holger Mey, *The Revolution in Military Affairs: Allied Perspectives*, McNair Paper 60 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, April 1999): 58.

[76] Patrick Bratton, "France and the Revolution in Military Affairs," *Contemporary Security Policy* 23, no. 2 (August 2002): 96-7.

[77] Armaments engineers with flag officer rank in the *Délégation Générale pour l'Armement* (DGA), the influential procurement branch of the French Ministry of Defense. It should be also noted that in March 1996 a special issue of the "in house" DGA journal, *L'Armemen*t, tackled "*les révolutions technico-militaires*." However, most of the articles adopted a historical perspective of the cases, and none of them specifically articulated what the RMA might mean for France's military organizations, concepts of operations, and technology-related investments. See *L'Armement,* no. 51 (March 1996): 4-165.

[78] Paul-Ivan de Saint-Germain: a) "Défense et hautes technologies," *Défense nationale*, (May 1993): 45-63; b) "La révolution technico-militaire aujourd'hui … et demain," *L'Armement*, no. 51 (March 1996): 124-8; and, c) "Un 'projet d'entreprise' pour les armées?," *Défense nationale* (August/September 1997): 7-14.

[79] Laurent Murawiec, "Les révolutions dans les affaires militares," *Commentaire*, no. 83 (Fall 1998): 749 and 753.

Lastly, one should not omit the influential academic Yves Boyer, whose views of the RMA during the 1990s had much more in common with those of skeptics than with those belonging to the *jeune école* (even if he was never affiliated with Alain Joxe's think tank). He argued in June 1998 that the RMA was *de facto* an American attempt to force Europeans to fit into a strategic model of defense in which they do not have any input and which does not really address the EU's security needs. While expressing concern about France's (and the EU's) ability to allocate the financial resources required by such a project, he highlighted the threat that such a model could pose to Europe's defense sector. He contended that the RMA represented for the military a form of "unidirectional thinking," similar to what globalization represented for the economy.[80]

The calls for the "Europeanization" of the French defense industry during the 1990s

Developing high-technology and shaping systems integration has been since the 1960s a key priority for both French industry and public sector. In France, the government integrates defense industrial policy with other industrial, economic, and social policies in a systematic way to develop a broader strategic-industrial perspective. In addition to the Délégation Générale pour l'Armement (DGA) and the Ministry of Defense, the Ministries of Economics and Finance, Industry and Foreign Trade, and Transportation participate in various aspects of defense-industrial planning.

Thus, against the traditional Gaullist, nation-centric approach which fostered the idea of military-industrial and technological self-sufficiency and autonomy, French decision-makers became aware of the fact that participation in modern warfare as highlighted by the Gulf War of 1990-91 had become a hugely expensive undertaking which could no longer be supported by exclusively national means. European cooperation after "Operation Desert Storm" began to be perceived as the only realistic avenue for obtaining those assets indispensable for balanced relations with the U.S. in advanced military capabilities, including those related to the RMA.[81]

Two factors contributed largely to this significant change. First, French armaments exports were in constant decline since the mid-1980s, causing great economic difficulties within the defense industrial sector (Chart 4). The substantial financial losses that accompanied this trend had a detrimental impact on the companies' ability to cope with the explosion of R&D expenditure imposed by the growing costs and complexity of the new arms systems required to fight modern wars (Table 1). This happened at the same time that France was increasingly under pressure to reduce its government contributions in the military R&D area in order to meet the heavy financial burden of finishing procurement of Cold War legacy systems.[82]

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[80] Yves Boyer, "Introduction," in Yves Boyer, ed., *Une révolution dans les Affaires Militaires?,* in Cahiers de la Fondation pour les Etudes de Défense, no. 13 (Paris: Fondation pour les Etudes de Défense, June 1998): 6-7.

[81] "Every year the United States spends the equivalent of the French defense budget (over 30 billion dollars) to maintain its intelligence capabilities, of which the core is composed of a coherent array of specific yet complementary satellites. This is beyond the reach of the budgetary means of countries such as France, Britain, or Germany. Its accomplishment can only be envisaged within a European defense community which technically and financially has the means to accede to such military space capabilities." General Jean-Claude Coullon, "Les leçons de la guerre du Golfe," *L'Année stratégique 1992* (Paris: Dunod, 1992): 149. As quoted in Yost , op. cit. (1997): 8. General Coullon was a former Inspector General of the French Army.

[82] For example, in the case of the Rafale fighter aircraft, as of 1993, it was estimated that even under the very optimistic scenario of export sales scenarios the French producing consortium would still bear a loss of 7.5. to 10 billion French Francs in un-recovered R&D investments. Yolande Simon, "Prospects for the French Fighter Industry in a

Chart 4[83]

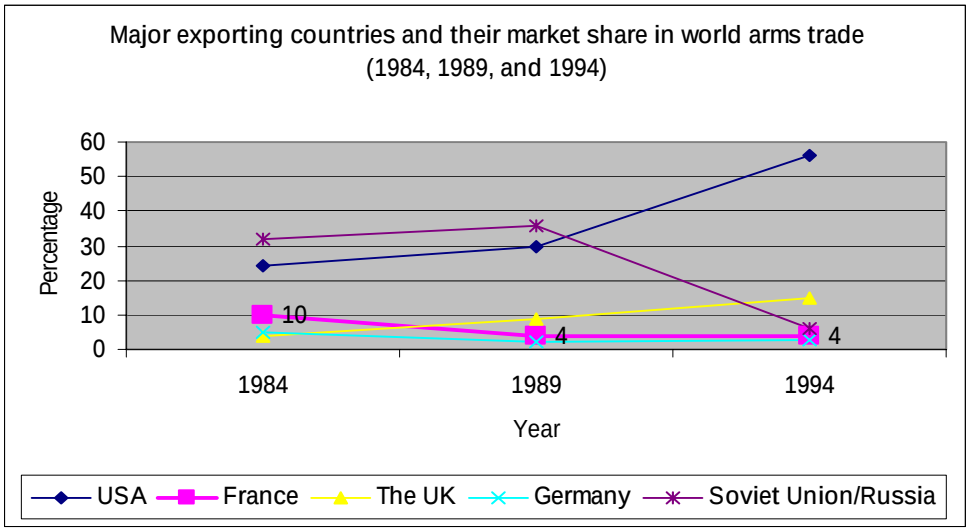

Table 1. The escalation of French military equipment costs (1974 and 1994)[84]

Costs	Equipment in 1974	Equipment in 1994
7-9 millions FF	1 AMX 30 tank	1 Super 530D missile
20-25 millions FF	1 Mirage II	1 Apache missile
70-80 millions FF	1 Mirage IV	1 Leclerc tank
200 millions FF	1 mine hunter	1 Tigre helicopter
500-600 millions FF	1 classical submarine	1 M4 missile
1,500 millions FF	1 frigate	1 spy airplane Hawkeye
2,500 millions FF	1 Foch aircraft-carrier	3 Rafale aircraft
3,500 millions FF	1 SNLE nuclear submarine	4 Atlantique-2 observer aircraft

Second, the problems associated in the early- and mid-1990s with the fear of reduced levels of defense R&D had a much wider impact because France's goals of independence were linked to the importance of government defense-related R&D. French analysts believed that reduced government funds for military R&D would force the French arms industry to lose its military competitiveness and exit additional international markets. As a result, since military R&D was not to be replaced by civilian funds, a major crisis for France's innovation and high-technology competitiveness was looming on the horizon.[85]

These judgments should be interpreted in the context that France between 1987 and 1995 maintained amazingly stable levels of defense spending (Chart 5). Furthermore, a French observer considered that if one took into account the expanding French economy, defense spending actually increased in real terms in France between 1985 and 1995 by 2% while over the

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Post-Cold War Environment: Is the Future More Than a Mirage?," RGSD-106 (PhD dissertation, Rand Graduate School, 1993): 327.

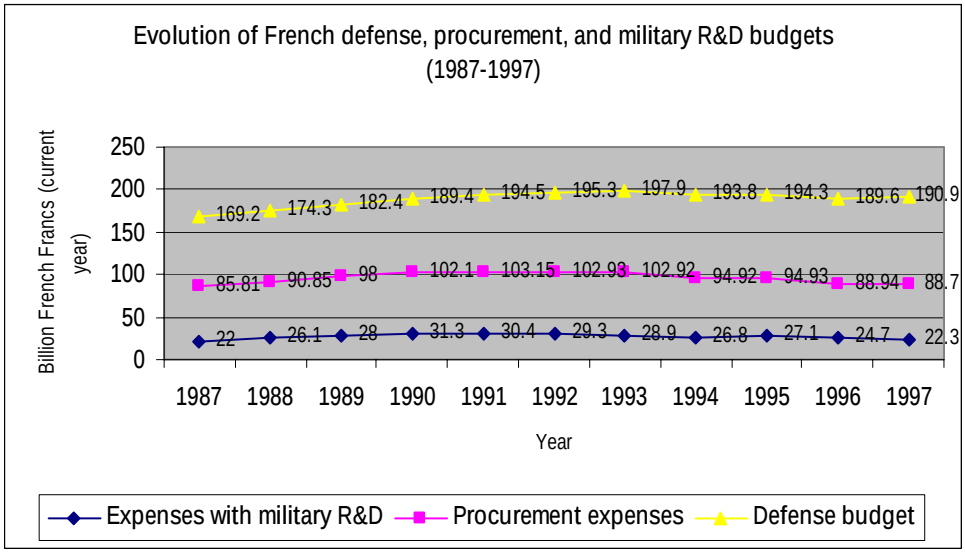
[83] Data adapted after figures presented in Pierre Dussauge and Christophe Cornu, *L'Industrie Française de l'Armement: Coopérations, restructurations et intégration européenne* (Paris: Economica, 1998): 80.

[84] Data presented in Table 8 in Jacques Fontanel and Jean-Paul Hebert, "The End of the 'French Grandeur Policy,'" *Defence and Peace Economics* 8, no. 1 (1997): 51.

[85] Fontanel and Hebert, op. cit (1997): 45.

same period it fell by 17% in the US, 20% in the UK, and 21% in Germany.[86] Additionally, between 1987 and 1995 the levels of government expenses on military R&D were reduced at comparable rates with those in the US (21%). However, while they remained constant in the US between 1995 and 1998, they continued to slide in France by 22%.[87]

Chart 5[88]



In the particular case of the French aerospace sector, several options were considered available in the early 1990s in order to overcome the difficult situation: a) diversification (to emphasize commercial aviation and thereby reduce the dependence of French aerospace companies on defense spending); b) consolidation of the French aerospace industry; c) creation of a European consolidated aerospace sector by the year 2000; and, d) increasing technology transfers to countries that have the need to expand their defense industrial base .[89]

Not initially considered was the increased participation in European defense industrial cooperation, but this path was ultimately chosen, in which the costs of R&D were shared and market potential was increased. As such, "[in the French case] European cooperation is clearly not an end in itself, but a means to procure the French industry the financing that is no longer available through national procurement alone."[90]

Five developments lend credence to the primacy of such a policy approach. The first document that announced the new orientation in French armaments policy was a report of the influential Commissariat Général au Plan, *L'avenir des industries liées à la défense,* published in late 1993, which concluded that French competitiveness in the defense industrial area could be preserved only by accelerating and intensifying European cooperation. It also acknowledged that

[86] Jean-François Couvrat, "Le défense coûte 52 milliards en trop au budget, " *La Tribune*, June 27, 1996.
[87] Source: *SIPRI* database.
[88] Data adapted after figures presented in Dussauge and Cornu, op. cit. (1998): 43 and 63.
[89] Simon, op. cit. (1993): 327-31.
[90] Edwina Campbell, *France's defence reforms: The "challenge of empiricism,"* London defence studies 36 (London: The Centre for defence studies, 1996): 22.

"the industries linked to defense are an essential component of France's level of technological and industrial development. It has been possible to mobilize this technological potential in the civilian field, and it has been a significant factor in the development of high-performance products…"[91]

The ambitious 1994 *Livre blanc sur la défense* called for the "Europeanization" of the French armaments policy and defense industrial strategy.[92] The document made it clear that with the exception of the nuclear sector, no other major armaments program should escape the "logic of European cooperation." However, for sectors considered strategic (i.e., intelligence gathering, communications, stealth, electronic warfare, and information operations) it stated that France could engage in European cooperative ventures but must retain the competencies and the capacity to produce such capabilities independently if needed. It also suggested that the French were becoming increasingly aware of the role that "dual-use" industries began to play in the post-Cold War setting. Finally, it recognized that the defense industrial sector must strengthen its position in European armaments cooperation to keep France at the forefront of strategic choices in relevant high-technology sectors (especially in the aerospace and information technology industries).[93]

On February 22, 1996 President Jacques Chirac contended in a televised interview that France could not be a great power without an efficient and competitive defense industry, since such a sector represented not only political independence and the ability to export, but was also the means to remain at the forefront of technological innovation in high-technology areas that bring benefits to the civilian sector as well. While describing the French industry as being "much too chopped up" to support France's international ambitions, he announced the government's intention to create "two great poles" of defense-related high technology in the areas of electronics and aerospace. Chirac considered that such a move could lead in the future to similar agreements, which in turn would lead to the creation of transnational European companies.[94]

Two other developments indicated that Europe was at the core of French efforts to reform its armaments networks. First, in July 1996 the *Loi relative à la programmation militaire pour les années 1997 à 2002* reaffirmed the French defense industrial sector's decision to give priority to international collaborative European armaments projects, especially with Germany, the UK, and Italy (Table 2).[95] Second, in December 1996, Jean-Yves Helmer, the Head of the DGA, went out of his way to underline the European dimension of the reforms in France's defense industrial sector, and emphasized in a special issue of the DGA's "in house" journal *L'Armement* that Europe was the primary idea around which the reform was to be built. He indicated that it had become clear

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[91] Commissariat Général au Plan (Groupe de stratégie industrielle présidé par Marcel Bénichou), *L'avenir des industries liées à la défense* (Paris: La Documentation française, 1993): 17.

[92] *Livre blanc sur la défense* (Paris: Union générale d'édition, 1994): 185-211.

[93] Ibid., 188-92.

[94] *22.02.1996: Intervention télévisée de Monsieur Jacques Chirac Président de la République interrogé par Anne Sinclair et Alain Duhamel*, text (accessed on July 10, 2003) from http://www.elysee.fr/cgi-bin/auracom/aurweb/search/voirf?aur_file=discours/1996/TV220296.html&THEME=INDUSTRIE+DE+L%5C%27ARMEMENT&aur_offset_rec=12.

[95] *Loi n° 96-589 du 2 juillet 1996 relative à la programmation militaire pour les années 1997 à 2002* -- text (accessed on August 10, 2002) from http://www.defense.gouv.fr/ema/texte/loiprog_old/princ.htm; and, c) *Rapport annexe loi de programmation* -- document (accessed on August 10, 2002) from http://www.defense.gouv.fr/ema/texte/loiprog_old/annexe.htm.

that future French arms programs, with the exception of those subject to national sovereignty constraints (i.e., the nuclear sector) would be cooperative European programs.[96]

Table 2[97]

Year	1996	2002
Funds intended to be allocated to international collaborative programs as percentage of the total cost of French armaments programs	15.6%	34%
Out of which with Germany	9.4%	22%
Out of which with Italy	8.3%	18%
Out of which with the UK	2.5%	13.9%

Germany and the RMA during the 1990s[98]

It is very hard to identify during the 1990s a German think tank or publication which focused in a consistent manner on the RMA topic. Germany was far more opaque than France with regard to the RMA debate, and, thus, few authors published serious analyses on this topic during the 1990s. The discussion about the RMA was carried out mostly behind closed doors (German MoD) and the public debate took place just within small academic community. Furthermore, it remains also a challenge to point out without any hesitations to an institute which during the 1990s openly presented analysis and developed products according to a "German strategic thinking" line of thought. [99]

Furthermore, there was *de facto* no serious interest of the political leadership with regard to the US-promoted RMA. To an advised observer such an attitude is not a great surprise, since, as Holger Mey incisively pointed out, "Germany's political class has shown much greater

[96] Jean-Yves Helmer, "Une politique d'armement adaptée aux nouveaux enjeux," *L'Armenent*, Special Issue (December 1996/January 1997): 60-64.

[97] Source: Jean-Yves Helmer, "Armement et rénovation du système de défense," *Défense nationale* (July 1996): 113.

[98] This section draws heavily on Sorin Lungu, "Military Modernization and Political Choice: Germany and The US-Promoted Military Technological Revolution During the 1990s," *Defense and Security Analysis* 20, no. 3 (September 2004): 261-72.

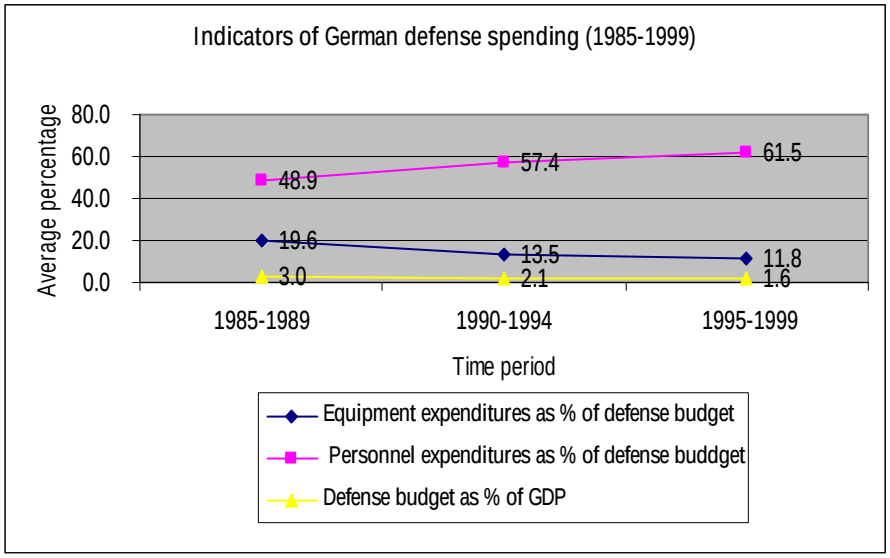
[99] Dr. Holger Mey is the only German author who was published in English on the topic of the German views with regard to the RMA of the 1990s: a) "The Revolution in Military Affairs: A German Perspective," *Comparative Strategy* 17, no. 3 (July/September 1998): 309-19; b) the section on Germany in Robbin Laird and Holger Mey, "The Revolution in Military Affairs: Allied Perspectives," *McNair Paper 60* (Washington, D.C.: Institute for National Strategic Studies, National Defense University, April 1999): 71-90; and c) "Technology Diffusion, International Military Modernization, and the German Response to the Revolution in Military Affairs," *National Security Studies Quarterly* 6, no. 2 (Spring 2000): 29-48. Other noteworthy German accounts of the RMA of the 1990s that appeared in French and German publications/journals are (1) Hans Rühle, ''RMA': un point de vue allemand,' in Yves Boyer, ed., "Une révolution dans les Affaires Militaires?," *Cahiers de la Fondation pour les Etudes de Défense*, No. 13 (Paris: Fondation pour les Etudes de Défense, June 1998): 17-30 (Dr. Rühle is a retired German Ministerial Director; former Head of the Planning Staff in Bonn's Ministry of Defense; and, former Director of the NATO MRCA/Tornado Agency); (2) Reiner Huber und Bernhard Schmidt, "Ein Dilemma für die Bundeswehr? 'Revolution in Military Affairs' und die Haushaltskürzungen," *Europäische Sicherheit* 48, no. 10 (October 1999): 33-9 (both authors where teaching at time of their writing at the University of the Bundeswehr in Münich); and, (3) Martin Koch, "'Die 'Revolution in Military Affairs' -- Zur Kritik eines Mythos," Europäische Sicherheit 49, no. 8 (August 2000): 51-4 (Dr. Hoch was then a researcher with the Konrad Adenauer Foundation).

reluctance when it comes to such things [the RMA-related concepts and systems]. This country does not particularly excel at strategic realism, at the long-term view, or at political courage."[100]

Three factors played a decisive role in defining and justifying Germany's approach and position vis-à-vis the US-led RMA during the 1990s. First, the German establishment did not identify the "third industrial revolution" as the driving force of change in world political, military, and security affairs. Moreover, it was considered that the purpose of German power, the role of military force, and the nature of strategic interests following the end of the Cold War must be clearly politically defined before embracing the RMA.[101] While the RMA was perceived by some as a "myth,"[102] the German military remained during the 1990s

> … wary of exotic technology and notions of a military revolution in military affairs. They will see it as neither affordable nor advisable to put too much confidence in technology for technology's sake. Military forces, most German observers believe, will continue to operate in what remains a very political world, where the war will still be a clash of human will, a struggle of opposing intensions. Technology can shape—but not determine—the outcome.[103]

Chart 6[104]



Second, for reunified Germany the very low levels of defense funding were a deliberate political option that forced the *Bundeswehr's* leadership to approach the German military "like a

[100] Mey, op. cit. (1998): 316.
[101] For example, according to the same Holger Mey, "Clearly, Germany has no interest in a sequel to Admiral Tripitz's blue water navy, a giant armaments program with poor strategic results." Mey, op. cit. (1998): 316.
[102] Martin Koch, op. cit. (2000). For another skeptical view of the RMA see Huber und Schmidt, op. cit. (1999).
[103] Mey, op. cit. (2000): 29-30.
[104] Figures up to and including 1990 refer to the Federal Republic of Germany (West Germany). Source: *NATO Defense Expenditure* database (accessed on August 15, 2003) from http://www.nato.int/docu/pr/2002/p02-139.xls.

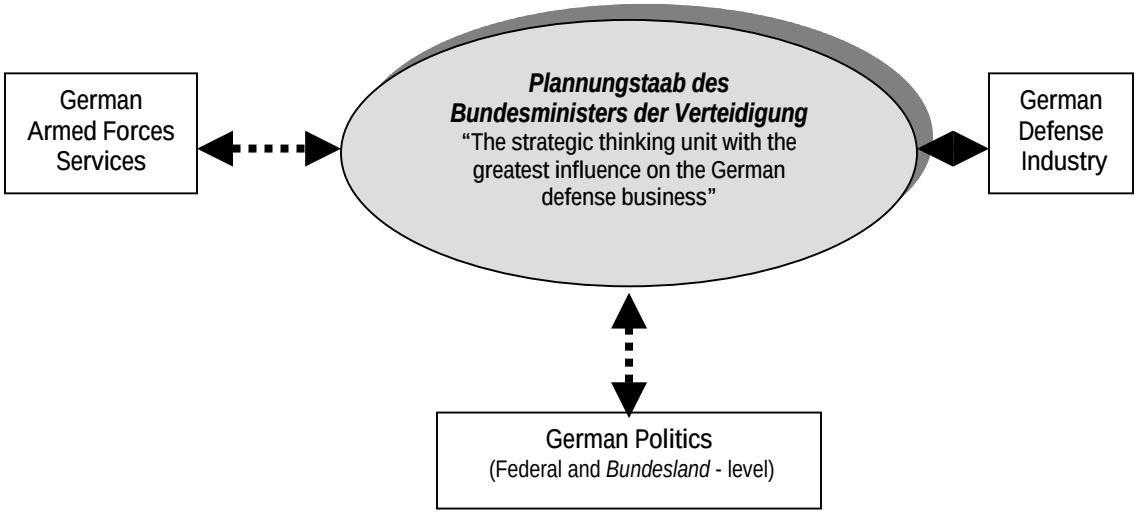
fighting force of the industrial era,"[105] primarily because the significant cuts have gone largely at the expense of military R&D and procurement (see Chart 6 and Table 3).

Table 3[106]

German government expenditures on military R&D (U.S. $ million, constant 1998 prices and exchange rates)				Change (%)		
1981	1987	1995	1998	1981-87	1987-95	1995-98
1,360	2,110	1,710	1,560	+55%	-19%	-9%

Such a development led, for example, during "Operation Allied Force" to the bitter conclusion that the German Air Force was only of conditional use in the sphere of modern aerial warfare.[107]

Figure 1. The influential players in the process of German defense budgetary planning and allocation



Finally, in comparison to the 1970s and 1980s, the defense industry's influence regarding the size and structure of the German military R&D and procurement budget decreased considerably during the 1990s. This new development had an impact on defining the mid- and long-term strategic planning priorities of the German MoD because it made all the influential

[105] Author's interviews in Sankt Augustin, June 24, 2002 and Brussels September 4, 2002.

[106] Figures up to and including 1990 refer to the Federal Republic of Germany (West Germany). Source: *SIPRI* database.

[107] "Germany's contribution to the air war over Kosovo consisted of 14 ECR Tornados to attack enemy anti-aircraft emplacements and four Tornados for reconnaissance. NATO did not ask for more - but for good reason. The rest of the Bundeswehr's fleet of Tornados was non-operational, because their air-to-ground armaments consisted exclusively of World War II-vintage bombs." Commentary by Hans Rühle in "Kosovo and Europe's Defence Illusions - The Widening Gulf Between Rhetoric and Practice," *Neue Zürcher Zeitung -- Online English Window* (6 August 1999).

players "more equal in their ability to influence decisions" and it also very much increased the level of conflict and competition among the interested parties (see Figure 1).[108]

Furthermore, from some industrialists' perspective defense budget cuts were implemented not only because of the new post-Cold War international strategic context, but also due to the fact that

> Defense Minister Volker Rühe lacked vision – he had no strategy and did not promote the development of adequate concepts for the German defense industry. He seemed concerned only with his political career, and, thus, all what he did was to take care of the daily (political) problems of the German MoD.[109]

Thus, even if industry was somewhat more inclined than the federal bureaucracy to exploit the new technologies associated with the RMA, its initiatives were rapidly contained by the lack of funds. The corporate sector succeeded in using the RMA concept to advance its agenda only regarding "simple and singular" projects, and, thus, the RMA debate did not have a real impact on Germany's defense industrial strategy during the 1990s.[110]

The following observations might provide additional insight with regard to the motivations shaping German views and defense industrial responses vis-à-vis the RMA during the 1990s:

During the 1990s, restructuring the reunified country was Germany's main strategic objective, and this project carried a heavy financial burden.[111] In this context, the country's top security policy priority was to stabilize economically, politically, and militarily its *Hinterland* (i.e., Central and Eastern Europe).[112] Thus, German elites focused their energies to bring the region into the European Union and NATO orbit, and, following that, into its own.[113] The German MoD fully acquiesced to this strategy, and, thus, did not focus primarily on the modernization of *Bundeswehr's* capabilities, but rather on foreign and security policy issues.[114]

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[108] Defense Minster Volker Rühe introduced the *Bundeswehr Plan, 1994 - 2006* in December 1992 and the industry was unable to oppose it. The document remained the cornerstone of German defense planning during the 1990s and was intended to reduce procurement spending by DM 24 billion. These cuts were in addition to the DM 43.7 billion reductions of the 1993 plan. These reductions were intended to be realized through the extension of procurement schedules, program cancellations, and reduced purchasing. The cabinet also ordered a reduction of DM 863 million in the 1993 defense budget shortly after the adoption of the 1994 *Bundeswehr Plan*. For the problems raised by such measures for the German defense industry see also Brian Davidson, "German procurement plans pose problems," *Interavia Business & Technology*, Vol. 48, No. 571 (October 1993).

[109] Author's interview in Berlin July 18, 2002.

[110] Author's interviews in Sankt Augustin (Germany), Bonn, and Berlin in June-September 2002.

[111] It was estimated that between 1990 and 1999 the German government had spent at least $500 billion in the new *Bundesländer* on infrastructure projects and social benefits. See, for example, "A Tale of Two Cities: After 10 years of unity, Germany is still a nation divided by its past and burdened by the costs of its future," *Time International* (October 9, 2000).

[112] See, among other sources, Bertel Heurlin, ed., *Germany and Europe in the Nineties* (London: Macmillan Pres, 1996).

[113] Hartmut Mayer, "German concepts on a European order," *International Affairs* 73, No. 4 (October 1997): 733.

[114] According to a well informed German interview source, during the 1990: "The Planning Staff was a collection of outstanding minds under the impressive leadership of Admiral Weisser, but unfortunately not focused on Bundeswehr capabilities, but rather on foreign and security policy issues." E-mail to the author on February 25, 2004.

Against this background, even if the debate about an increased role in global political (and not only economic) world affairs was not totally neglected by the post-Cold War German leadership,[115] only after the Kosovo crisis of 1998-99 did German elites publicly argue for the need for more influence, and, thus, for acquiring some of the power projection and intelligence capabilities that would support such an undertaking.[116]

The conservative approach of the German defense bureaucracy vis-à-vis the benefits of "military technological revolutions" has a long (post-World War II) tradition. The *Bundeswehr* usually defended its lack of enthusiasm with the following arguments:

- In practical terms, technological revolutions require much longer time than initially forecasted; and,
- The revolutionary character of new military technologies has to be estimated with pragmatism and embraced only at the moment when concrete results are available.[117]

Furthermore, bureaucratic politics inside the *Plannungstaab* might have also limited Germany's potential to be at the forefront of RMA thinking during the 1990s. Career advancement could have been endangered if such a line of thinking was not "pleasing" the political imperatives of the moment. Finally, due to such a dynamic, several interview sources believed that the quality of the analysts (with competency and courage to fight for their ideas) in the German MoD Planning Staff did not maintain the same standards as had been evident before the end of the Cold War. However, it must be said there were some individuals -- both in the industry and in the defense ministry -- who tried to give the proper importance to the RMA-related "new wave" of thinking which was dominating the debate in the US. But with no political support for their concepts, and, most importantly, no will to spend money for the modernization of the *Bundeswehr*, "their ideas had absolute no value in practical terms."[118]

The Gulf War of 1990-91 made the object of serious analysis in the German MoD and the RMA debate in the US was closely followed. Moreover, the German military leadership recognized

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[115] Mey, op. cit. (2000): 32. It must be also mentioned that the Gulf War of 1990-91 came as a major shock to Germany, forcing it to rethink its military role in the world. Although the country provided massive financial support for the allied war effort in the Gulf, the Germans proved virtually incapable of providing serious military support. Moreover, the Kohl government was paralyzed in the face of a growing tide of American diplomatic pressure to get more involved. As a result, in the aftermath of the first Gulf War, a consensus emerged among German elites that they had survived a close call. Had the US suffered significant casualties and become bogged down in a Vietnam-like quagmire in Iraq -- as had been predicted by many experts in the United States and elsewhere -- Germany's conspicuous absence from the fighting would have substantiated charges of "free riding" on an international security order paid for with American lives. See, among other sources, Thomas Berger, "Unsheathing the Sword?," *World Affairs* 158, no. 4 (Spring 1996): 174-91.

[116] See, for example, a) Gerhard Schröder, *Germany's Foreign Policy Responsibility in the World* (Berlin: DGAP, September 2, 1999) – text (accessed on August 20, 2003) from http://www.dgap.org/IP/ip9910/schroder020999.htm; b) Rudolf Scharping, *Baselines of German Security Policy* (Hamburg: The German Command Staff College, 8 September 1999) – text (accessed on August 20, 2003) from http://www.dgap.org/IP/ip9910/scharping080999.htm; and, c) Rudolf Scharping, *The Kosovo War: Consequences for the European Security and Defense Policy* (Berlin: DGAP, October 26, 1999) – text (accessed on August 20, 2003) from http://www.dgap.org/texte/scharping261099.htm.

[117] Rühle, op. cit (1998): 28.

[118] This paragraph draws on author's interviews in Sankt Augustin, Bonn, and Berlin in June-September 2002.

the validity of the RMA concept and was well aware that innovation in advanced military technology will be increasingly commercially driven. However, the RMA was considered only as an alternative to the already established planning mechanism for the German armed forces. This approach limited considerably its significance to German high-level political authorities and, as such, the concept was never employed as an efficient pressure tool for increased levels of defense funding.[119]

As long as money remained, together with mentality, Germany's main "defense problem," the industry (privately owned and, thus, profit driven) tried primarily during the early and mid-1990s to minimize the risks associated with its defense subsidiaries.[120] Because global competitiveness became clearly the yard-stick for measuring performance in the 1990s, the German defense companies focused primarily on restructuring in industrial activity that directly reflected reductions in the procurement budget and the need to maintain their export markets.[121] For example, in spring of 1996, according to Manfred Bischoff, then DASA's[122] recently appointed President declared:

> In the past, there have been great visions and great excitement in our industry but it has not been generally realised that it is not just a question of the product, of the market, of excitement--there is also the question of something called profit. Profit is sometimes regarded as an ugly thing, but it is a pre-requisite for success in a market economy. [123]

In this setting, with its priorities clearly lying elsewhere, the corporate sector made during the 1990s "little effort to encourage German military authorities to think about the implications of the RMA."[124]

Although, even if the *Bundeswehr* was becoming increasingly involved in "out-of-area" operations,[125] Germany remained before the 1998-99 Kosovo crisis marked by an extremely territorial (static) conception of its defense and, as such, the word "projection", was not considered a key concept (if any) in the German military vocabulary during the 1990s. For example, the 1994 *Weissbuch zur Sicherheit der Bundesrepublik Deutschland und zur Lage und Zukunft der Bundesrwehr*, the key document that defined and shaped Germany's defense and security policy

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[119] Rühle, op. cit. (1998): 28.

[120] By government policy, Germany's defense industrial base lies almost entirely within the private sector, although many have stock owned by federal states or banks. There are no government defense production plants, and most defense industries are also heavily involved in civilian markets.

[121] See, among other sources, Hartmut Küchle, *Rüstungsindustrie im Umbruch: Strategien deutscher Unternehmen und Ansätze einer europäischen Neuordnung* (Baden-Baden: Nomos Verlagsgesellschaft, 2001).

[122] DASA stands for Deutsche Aerospace A.G.

[123] As quoted in Brian Davidson, "Profits the top priority for DASA's new boss," *Interavia Business & Technology* 51, no. 599 (April 1996).

[124] Furthermore, "Specializing in component production, the industry engages in little thinking about the growing role of systems integration. With little industrial system competence, there is little capacity for system leadership." In Laird and Mey, op. cit. (1999): 80.

[125] Post-Cold War German military forces have been used before the Kosovo 1999 air campaign also in the coalition against Iraq in 1991, in support of United Nations operations in the former Yugoslavia since 1992, and in Somalia in 1992.

for the decade, makes absolutely no reference to such a concept.[126] Moreover, another example that supports this argument is Germany's strong resistance during the mid-1990s to France's discreet requests aimed at encouraging the *Eurocorps* to move towards greater flexibility and inter-army capabilities and hence to its adaptation to selective light operations.[127]

Finally, two other points are noteworthy. First, despite the acknowledgement that "information dominance is not just a force multiplier but also a strategic instrument," skepticism regarding the revolutionary impact of information on warfare remained widespread among German military authorities during the 1990s.[128] Second, the German military perceived during the 1990s "space as a tool, not as a battleground," and, thus, some experts considered that Germany was not very active during the 1990s in developing a consistent approach toward the military dimension of its space policy. However, other reports suggest that it was primarily the lack of resources and not exclusively the German political and military will that in the end forced Germany not to develop or acquire the much needed defense-related space capabilities during the 1990s.[129]

Putting the dots together

This section should be viewed as an attempt to answer an important question for the development of the transatlantic relationship in 1987-99: Why, on one hand, did leading continental European nations do very little to reshape their military instruments according to the RMA concepts and systems promoted in the US and yet on the other hand, decide to assign (since the late 1980s) a significant priority to aerospace high-technology European-level projects advertised as civilian, but which evolved (or could easily evolve) to become strategic and which clearly meant fostering a "collision course" with the US?

Based on the evidence presented insofar in this paper one may conclude that post-Cold War developments in US commercial and defense high technology policies were perceived by Europeans as having the potential to diminish their ability to influence international foreign policy and economic affairs. Faced with this possibility and with both limited financial resources and domestic challenges, Europe opted to defend its power status and interests with those tools that it mastered best. In other words, it decided to strengthen its profile as a mercantile power and to pursue first and foremost precisely targeted civilian originated projects that could (even in a longer run) acquire simultaneously relevant geo-economic and strategic significance.

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[126] *Weissbuch zur Sicherheit der Bundesrepublik Deutschland und zur Lage und Zukunft der Bundesrwehr* (Bonn: Bundesminsterium für Verteidigung, April 1994).

[127] Guillaume Parmentier, 'French and German defence policies in 1997,' in "La France et le Japon face aux nouvelles questions de sécurité," *Cahiers de L'Ifri 21* (Paris: Institut français des relations internationales, 1997): 29.

[128] "Germans still approach information warfare, in the sense of information strikes and information defense, in the traditional way. The focus is on assuring secure communications while being able to destroy, jam, or otherwise disrupt enemy communications. Strategic information warfare across the depth of a battlefield is still very much in the conceptualization stage." As presented in Laird and Mey, op. cit. (1999): 86.

[129] For some of Germany's intentions and attitudes vis-à-vis the Helios-2, Horus, TriMil-Satcom, and Galileo projects during the 1990s, see for example: Alexander Szandar, "New aerospace priorities for Germany's defence," *Interavia Business & Technology* 51, no. 597 (January/February 1996); Alexander Szandar, "Friction in Franco-German aerospace relations," *Interavia Business & Technology* 51, no. 599 (April 1996); Parmentier, op. cit (1997): 36-7; Chris Bulloch, "Space for investment," *Interavia Business & Technology* 53, no. 626 (December 1998); Alexander Szandar, "Germany's space push," *Interavia Business & Technology* 54, no. 631 (May 1999); and, Chris Bulloch "Europe's national space agencies contra ESA," *Interavia Business & Technology* 54, no. 635 (October 1999).

The following observations are intended to advance understanding of why the European Union's leading powers chose to compete with the US in areas such as *Airbus Industrie* and Galileo but not in the RMA, despite the advocacy of some French experts.

I. Since the late 1980s the European Commission as well as some leading European countries perceived that Europe was in danger of losing out in critical growth markets and industries (e.g. the aerospace sector, to include large commercial aircraft such as Airbus, and satellite navigation systems such as Galileo) and, thus, that an appropriate response was urgently needed. Furthermore, it was assessed that losing economic growth potential could translate in the end in weakening the economic basis for an independent pursuit of its foreign policy interests. Finally, there is no doubt that serious restructuring actions in the defense aerospace sector have emerged only after the 1996 Boeing–McDonnell Douglas merger threatened Airbus's promising success in the commercial marketplace.

II. After the Gulf War of 1990-91, despite more or less open skepticism, both France and Germany fully understood that a new military-technological revolution "was on its way" and that this meant primarily that the relationship between the high-technology industrial base and military capabilities would undergo fundamental changes. All RMAs essentially negate the investment in obsolescent military capabilities and, thus, require the expenditure of significant resources. During the 1990s, this was beyond the budgetary reach of almost all of the individual EU member countries. And, because Europe also had to cope also with other complex and urgent challenges,[130] this required the setting of priorities.

In this setting, because the price tag associated with the RMA was considered very high and the available resources so scarce that neither France nor Germany (neither any of the other European states) states had by itself the economic capacity or the will to shape an exclusively national response. Thus, if a response to the American military-technological revolution was to be eventually considered, due to the costs involved, the only realistic option was a European-level one. With great relevance, even French defense industrial policy-makers were realizing that they could not maintain through exclusively national efforts "Europe's" defense-technological competitiveness distinct from that of the commercial sector.

Against such a background, a consortium like *Airbus Industrie* was logically granted a great strategic significance because it may well was perceived as the only success model for a European framework for civil to defense technology spillover and for cross-subsidization between the defense and civilian sectors.

III. As Table 4 and Chart 7 indicate, the major Western European countries lost export market shares to the US during the period between the late 1980s and late 1990s, not only in civilian high-technology sectors but also in defense. This situation was, especially in the defense field, in sharp contrast with the 1980s which were considered the "golden age" of European armaments production. Further, shrinking defense export markets were associated in Europe,

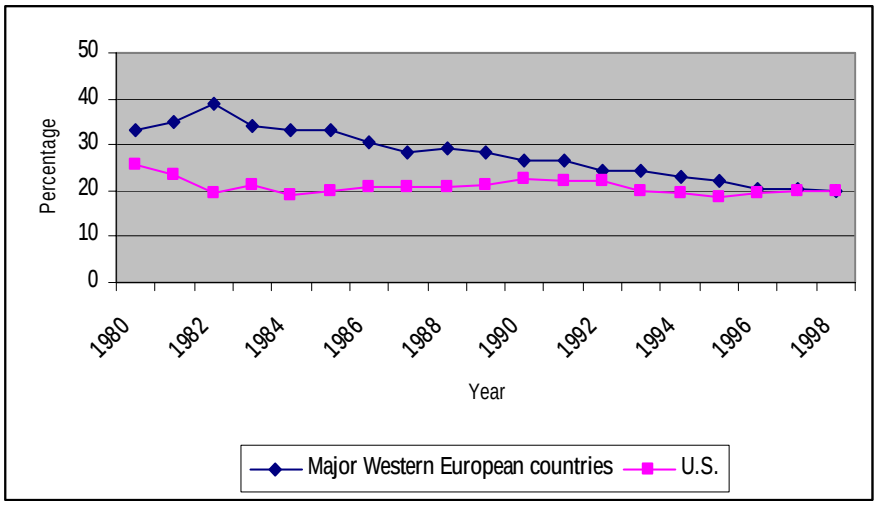
[130] Among others, one should mention at least the debate about the reform of the existing welfare state structures, relative high levels of unemployment, the compliance with and enforcement of the Maastricht convergence criteria, the introduction of the euro, and the process of eastward enlargement.

particularly in France, not only with less influence in world affairs but also with a potential decline competitive in the nation's high-technology industries.

Table 4. Arms deliveries to the world by supplier 1987-99, expressed as (average) percent of total, by year/period[131]

(Period/Year)/Country	1987-1989	1990-1992	1993-1995	1996	1997	1998	1999
U.S.	12.5	28.2	40.7	42.26	40.62	46.92	54.05
Soviet Union/Russia	47.7	26.7	9.9	8.33	6.65	5.93	7.95
China	6.8	6	4.4	1.72	2.46	1.69	0.88
Major Western European countries (France, UK, Germany, and Italy)	16.4	28.4	33.1	33.03	35.23	33.31	24.15

Chart 7. High-technology exports world market share 1980-98: U.S. and major Western European countries (Germany, France, UK, and Italy)[132]



IV. Against this background, it is now the moment to recall that the "trade-defense linkage" was also identified after the end of the Cold War as an area of great concern in Europe. More precisely, as supported by the elements presented earlier in this dissertation, several European analysts warned that US high-technology supremacy (both in the military and commercial sectors) could become the main external factor in determining Europe's economic prospects and, thus, its political autonomy in the early 21st century.[133]

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[131] Data derived from Table 1 in Rohde and van Scherpenberg, op. cit. (1997): 26; and, Table 9B in Richard Grimmett, *Conventional Arms Transfers to Developing Nations, 1994-2001* (Washington, DC: Library of Congress, Congressional Research Service, August 6, 2002): 78.

[132] Data derived from Appendix 6-1 presented in U.S. National Science Board, *Science and Engineering Indicators – 2002,* NSB-02-1 (Arlington, VA: National Science Foundation, 2002), document (accessed on August 20, 2003) from http://www.nsf.gov/sbe/srs/seind02/append/c6/at06-01.xls. High-technology industries cover aerospace, computers and office machinery, communications equipment, and pharmaceuticals.

[133] See, for example, Boyer, op. cit (1994), van Scherpenberg, op. cit (1997), Rohde and van Scherpenberg, op. cit (1997), and, Grant, op. cit (1997). It was considered that Ethan Kapstein's 1994 short *Foreign Affairs* article was providing evidence for the American thinking that that in terms of effective market dominance the US monopoly on

This did no exclude the possibility (especially after the victory in the Gulf War of 1990-91) that the US could manage the commercial return on defense investment in such a way that it would increase its influence on the EU's ability to promote its own foreign and commercial policy agenda, especially with regard to the developing world (the Gulf region, the Far East, and South America).[134] It was perceived that the US was changing the pattern of competition in international politics by translating defense technological superiority into global market share. Thus, it was considered that by indirectly linking trade and security, access to foreign markets could be forced, competitors could be discouraged, and an expansion of global market shares could be achieved. Two German observers expressed the following opinion in 1997:

> Put in more general economic terms, what we see is a confirmation of the capacity of technological capabilities and their industrial and commercial applications to produce substantial positive externalities, not merely in the narrow economic understanding but also in a wider political sense. [135]

Europe was seriously challenged to develop the optimal response to the need to combine the transformation of European high-technology industry with new technologies for the military in a totally different international competitive environment. It appears that European elites decided to assign greater priority to high-technology non-military projects that in the end would also have the ability to produce "substantial positive political externalities." Moreover, several other factors might have colored the European preference for such projects, even if this meant pursuing policies which were promoting colliding industrial, commercial, and (ultimately) security interests with the US.

V. As Table 5 indicates, it appears that the post-Cold War levels of US defense spending (especially R&D and procurement) coupled with the vigorous pursuit of the RMA may have dissuaded the Europeans to engage the Americans in an "armaments race."[136] In other words, Europeans did not fully embrace the option of building those military and defense industrial capabilities required for an autonomous military power projection structure and, thus, for the ability to provide security to other countries worldwide in competition with the US. It must also be mentioned that by the mid-1990s German experts at the Stiftung Wissenschaft und Politik assessed that

> [p]resently, the US monopoly is not equally strong in all sectors of the market. … the implementation in the new US military doctrine of what has become known as the "revolution in military affairs" and of the technologies on which it is based, will, however, consolidate the US position. In the near future, no other country but the

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arms technology and trade - and hence on providing security - which may derive from such superiority does, indeed, already exist. See Ethan Kapstein, "America's Arms-Trade Monopoly," *Foreign Affairs* 73, no. 3 (May/June 1994): 13-9.

[134] See Rohde and van Scherpenberg, op. cit (1997): 1-2 and 21-3. For an analysis of the changing nature of transatlantic rivalry in the Persian Gulf already emerging by the mid-1990s, see also Tom Lansford and Steve Yetiv, "Euro-American rivalry and security in the Persian Gulf," *Defense Analysis* 3, no. 1 (April 1997): 103-17.

[135] Ibid.: 2.

[136] By mid-1990s is was generally accepted in the US that "the R&D investment strategy should focus on an entirely new set of systems ready to be deployed in 2015 to 2020 ... to provide the ... technological and raw military superiority the United States will require if it is to meet the challenge of great power competition on the Eurasian mainland." As presented in Don Snider, Daniel Gouré, and Stephen Cambone, *Defense in the Late 1990s: Avoiding the Train Wreck* (Washington, DC: Center for Strategic and International Studies, 1995): 23.

US will have the "system of system" integration capability which is characteristic of this new concept.[137]

Table 5. Defense expenditure in Western Europe and the U.S. (1991–99)[138]

Year	1991	1995	1996	1997	1998	1999
Military equipment expenditures (MER U.S.$ bn at constant 2000 prices)						
NATO Western Europe (figures do not include France before 1997)	22.6	18.1	19.2	25.9	26.2	26.4
U.S.	96.7	87.3	80	77	74.1	72.4
Military R&D expenditures (PPP bn U.S.$ at constant 2000 prices)						
Total EU	14.9	11.1	10.9	10.5	9.8	9.8
U.S.	49.7	42.1	41.6	42.5	42	42.7
Total defense expenditures (U.S.$ bn at current prices and exchange rates)						
NATO Western Europe	...	184.35	186.82	172.73	175.3	179.66
U.S.	...	278.85	271.41	276.32	274.27	280.96

Such a decision might have also been supported by the fact that in the particular case of the defense industry, no leading European power had the slightest intent to abolish Article 223 of the Treaty of Rome; and, thus, to forge a European-level response -- the only option with the potential to successfully keep up with the US "threat." All that happened during the 1990s was that the EU member states governments shifted the focus of the RMA debate towards the development of a common EU procurement base.[139]

But even if the establishment of leading Western European nations of OCCAR in November 1996[140] introduced some fundamental innovations, long-awaited by industry,[141] the organization had done little as of the end of the 1990s to define a common intergovernmental view on whether there should be a distinctively European arms market or arms procurement policy. Furthermore, WEAG (created in 1991 under the WEU) and WEAO[142] might have addressed the

[137] Rohde and van Scherpenberg, op. cit (1997): 18-9.

[138] Source: *SIPRI* and *NATO Defense Expenditure* databases. France has not provided data to NATO for a breakdown of its military expenditure before 1997. Furthermore, data on military equipment and military R&D are not comparable because data on military R&D are converted at purchasing power parity (PPP) rates, while equipment data are converted at market exchange rates.

[139] Author's interviews in Sankt Augustin (Germany), June 24, 2002 and in Brussels, September 4, 2002.

[140] OCCAR was the result of French and German dissatisfaction with the lack of progress WEU was making in establishing a European armaments agency. Joined by Italy and the UK, the four nations agreed on November 12, 1996 to form OCCAR as a management organization for joint programs involving two or more member nations.

[141] Pierre Condom, "One step forward," *Interavia Business & Technology* 51, no. 605 (December 1996).

[142] On November 19, 1996, a week after OCCAR was created, the WEU Ministerial Council established WEAO to improve coordination of collaborative defense research projects by creating a single contracting entity. See Chapter VI, paragraph 33 of the *WEU Council of Ministers Ostend Declaration* (Ostend, November 19, 1996). Text (accessed on April 20, 2000) from http://www.weu.int/eng/index.html.

right issues but both lacked the means and structures to find satisfactory solutions.[143] By late-1990s, according to a British observer:

> In fact, the WEU has had virtually no impact on the defense industry other than to oblige it to send representatives to a maze of new organizations. The WEU and WEAG networks remain largely talking shops. Although the reinvented NATO alliance structures have claimed the security and defense high ground, they have had little impact on the industrial aspects of defense. ... [I]t now appears that OCCAR is likely to be the formal framework under which a collective European procurement structure will eventually be established. But for this to be successful, a cultural change is required.[144]

Moreover, defense R&D spending and procurement was the subject of very little (if any) coordination at the supranational level in the EU. And because each EU member nation planned and executed during the 1990s its own defense policy with little or no regard to a common EU defense policy, pursuing a military response to the US high-technology challenge (the RMA included) was not a realistic option.[145]

VI. Taking into account Europe's strategic perspective before the Kosovo crisis of 1998-99, it was generally considered that the existing European defense capabilities would enable the European armed forces to handle conflicts at their periphery in a satisfactory manner. Moreover, during the mid- and late-1990s, despite numerous US warnings about the increasing capabilities gap between the transatlantic partners the "free riding" behavior (inherited from the Cold War years) of most of its European allies continued.[146]

VII. By late 1980s-early 1990s the European Commission was perceived as being "frantic to arrest its decline in the high-tech arena, and to maintain at least a few corporate champions."[147] As such, it attempted to fully exploit the favorable market conditions in the civilian aerospace sector

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[143] See, for example, Andrew James, "The Current State of European Cooperation in the Field of Armaments," in Gianni Bonvicini and Giovanni Gasparini, eds., *Le Cooperazioni rafforzate per la Ristrutturazione dell'Industria Europea degli Armamenti* (Rome: Military Center for Strategic Studies, MoD Italy – 2003). Document provided via e-mail (dipstepi.cemiss@casd.difesa.it) by Colonel Angelo Pagliuca (from the Center's Technology and Industrial Policy Department) on October 1, 2003.

[144] John Lovering, "Which Way to Turn? The European Defense Industry After the Cold War," in Anne Markusen and Sean Costigan, eds., *Arming the Future: A Defense Industry for the 21st Century* (New York: Council on Foreign Relations Press, 1999): 357.

[145] Assessment based on authors interviews in Paris, Bonn, Berlin, Sankt Augustin (Germany) in May-September 2002.

[146] Probably a more nuanced and accurate analysis would suggest that the Americans wanted less "free-riding" behavior in some capability areas but indented to maintain US superiority in others. Several policy initiatives of US administration officials during the 1990s support such an assessment. For example, in 1993 Secretary of Defense Les Aspin tried to convince his NATO counterparts to agree to U.S. "counter-proliferation" concepts and to make the necessary. Then, Secretary of Defense William Cohen and his DoD colleagues began in late 1998 to push what became NATO's Defense Capabilities Initiatives (DCI) in April 1999. Finally, Secretary of State Madeleine Albright tried to convince her NATO counterparts to adopt a more "global" conception of the Alliance's purposes and to make corresponding improvements. I am thankful to Dr. David Yost for this observation.

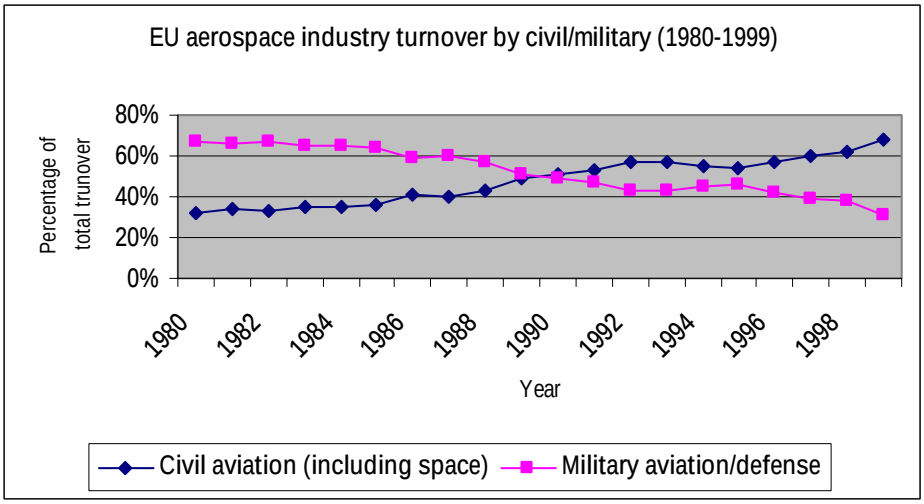
[147] The computer and aerospace industries were two of the major areas of concern. Jeffrey Garten, *A Cold Peace: America, Japan, Germany and the Struggle for Supremacy* (New York: Times Books, 1993): 148-9. The computer and aerospace industries were two of the major areas of concern.

and successfully revitalized *Airbus Industrie*. Throughout the 1990s the European Commission, industry, and government groupings all made efforts to define common positions on market orientation in order to consolidate the success of *Airbus Industrie*.

Several measures highlight this constant preoccupation: First, the Trilateral Statement (France, Germany, and the UK) of December 9, 1997 calling for the restructuring of the European aerospace and defense industry where the first step was considered to be swift progress in establishing *Airbus Industrie* as a "Single Corporate Entity."[148] Second, the declared position of the European aerospace industry, as laid out in September 1997, that market orientation should be global with the European origin of potential exports downplayed in order to secure overseas sales in expanding markets such as the Far East and South America.[149]

Finally, in EU's Fifth Research, Technology, and Development (RTD) Framework Program (1998-2002) the financial support for the aeronautics "Key action" was set in December 1998 to euro 700 million. The amount for the 1999-2002 period has been increased to considerable more than twice the euro 240 million provided for specific aeronautics research in the previous program (1994-98). Moreover, for the first time, aeronautics appears as a separate "Key action" within a RTD Framework Program, under the name "New perspectives for aeronautics." It could be considered another milestone on the path of a growing recognition that for Europe the aerospace sector has both political and economic dimensions.[150]

Chart 8[151]



[148] See the French version of the joint-declaration (accessed on August 22, 2002) from http://www.defense.gouv.fr/actualites/communiques/979899/c091297/091297b.html.

[149] The European Association of Aerospace Industries, *Aerospace Industry Restructuring -- The AECMA View: Report from the AECMA Industry Restructuring Working Group* (Brussels: AECMA, September 1997): 10.

[150] See, for example, a) European Commission, "Fifth Framework Programme: 23 Key actions" in *RTD info 21 (Supplement)* (February 1999); and, b) 'Annex I' to the European Council's "Decision of January 25, 1999 adopting a specific programme for research, technological development and demonstration on competitive and sustainable growth (1998 to 2002)," in *Official Journal of the European Communities* (March 12, 2003).

[151] Source: data presented in Figure 3 in *AECMA Facts & Figures 2000* (Brussels: AECMA, 2000): 34. AECMA is the acronym for the Brussels-based European Association of Aerospace Industries.

As a result of such initiatives, as Chart 8 presents, in Europe the civil aerospace sector had become increasingly more important to the EU aerospace industry turnover than military aerospace. The relationship moved from a 35 to 65 ratio in the early 1980s to a 68 to 31 ratio in 1999, with 1989 being the turning point.[152] In this context, one should not be surprised that, in a 2002 assessment of the 1980-98 period, the US National Science Board concluded that the aerospace, the US high-technology industry with the largest world market share, was the only industry to lose market share in both the 1980s and the 1990s.[153]

VIII. Finally, during the 1990s, the number of official transatlantic aerospace defense programs has dwindled to a handful,[154] of which the frequently-threatened MEADS air defense system was probably the most notable.[155] The 1990s witnessed significant and growing obstacles to achieving a more open and flexible transatlantic regime for defense industrial and technological cooperation. Most of these obstacles were the result of government policies primarily in the United States, but increasingly in Europe, as well.[156]

Final remarks

European elites have been worried since the late 1980s that they would not be a winner in the kind of Schumpeterian competition that characterizes typical technology-intensive industries like the aerospace. Furthermore, they assessed that this would translate in losing yet another significant battle for setting (new) technical standards and the markets they make. The RMA of the 1990s, a formidable power projection tool available almost exclusively to the US, heightened European fears with regard to such a development. In this context, some of the European Union's leading powers (read France and Germany) chose since the late 1980s and throughout the 1990s

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[152] In combination with the trend towards privatization of national civil airlines, this means that European aerospace companies depended at the end of 1990s less on government contracts than they did 15-20 years ago. This trend also possibly indicates that the recession of the early 1990s was largely due in the European perception to the decline in the military aircraft market. The civil aerospace market was much less affected and has shown long-term growth.

[153] "For most of the 1980s, the U.S. aerospace industry supplied more than 60 percent of world demand. By the late 1980s, the U.S. share of the world aerospace market began an erratic decline, falling to 58.9 percent in 1989 and 52.1 percent by 1995. The United States recovered somewhat during the following three years, supplying about 55 percent of the world market from 1996 to 1998." As presented in Chapter 6, US National Science Board, op. cit. (2002): 7. Text (accessed on August 20, 2003) from http://www.nsf.gov/sbe/srs/seind02/pdf/c06.pdf.

[154] Although the F-35 Joint Strike Fighter has a number of European participants, it did not qualify during the 1990s as an official transatlantic program. It was, rather, a U.S. program with European participants, of which the UK is by far the most equal. "JSF is, however, a harbinger of things to come - a dominant U.S. program, whose growth could gradually drive European producers out of the airframe business." As contended by Gordon Adams in *Transatlantic Defense-Industrial Cooperation and American Policy*, paper presented at the European Security Forum in Brussels, on November 25, 2002.

[155] The MEADS's European partners during the 1990s were France, Germany, and Italy. For background on the MEADS program during the 1990s, see, among other sources, Robert Engelhardt, *The Medium Extended Air Defense System: A Renaissance in Trans-Atlantic Armaments Cooperation*, unpublished MA thesis (Monterey, CA: Naval Postgraduate School, March 1999). Thesis (accessed on May 10, 2003) from http://handle.dtic.mil/100.2/ADA362935.

[156] See, among other sources: a) John Apleby and Edward Foster, "Up in the air: European Union and transatlantic defence industrial co-operation," update to *Whitehall Paper No. 6* (London: RUSI, 1993); b) Gordon Adams, Christophe Cornu, and Andrew James (edited by Burkard Schmitt), "Between cooperation and competition: the transatlantic defence market," *Chaillot Pape r40* (Paris: WEU Institute for Security Studies, January 2001); and, c) François Heisbourg, "From European Defense Industrial Restructuring to Transatlantic Deal?," *Working Paper 4* for the "CSIS Study Group on Enhancing Multilateral Export Controls for U.S. National Security" (Washington, D.C.: CSIS, February 2001).

to asymmetrically balance against the United States hegemony and to trade-off military capability for economic competitiveness. Thus, they decided to compete with the US in areas such as Airbus and Galileo, but not in the RMA.

Although the EU did not become a real superpower by the end of the 1990s, the creation of a stronger European aerospace sector for the purpose (at least in part) of standing up to the US was a goal explicitly and widely shared by elites in the EU since the late 1980s. They favored a strategic orientation in the aerospace sector that promoted the chance to exploit existing market opportunities and thereby give the EU a much-needed economic boost and, at the same time, buy a certain degree of strategic independence. Furthermore, the EU seems very determined to best defend its interests in the next round of the ongoing battle with both Galileo and *Airbus Industrie*.

In this context, based on the successful example of *Airbus Industrie*, the Galileo project, if *de facto* launched and implemented, will probably follow a similar strategy for the next decade or so. It will first focus on breaking the virtual US technological and commercial monopoly provided by the GPS system, and then focus to profiting from the interest of buyers in a major non-US supplier of services and equipment. If these first two, essentially commercial, steps succeed, an increased EU role in world military and security affairs would be just another small step away.

Furthermore, Airbus and Galileo possibly united the Europeans by default: because defense projects could be seen as challenging the US security strategy, they tended to be limited to a small cast of players and were tactical rather than strategic in scope (e.g. French-German armaments cooperation). Conversely, however displeasing Airbus was for Boeing or McDonnell Douglas, the US could not present this as a threat to NATO. However, it is also true that in any project, whether it is or isn't decided by default, it is the strategically focused partner (usually the French in the case of European projects) who shape the course of the program.

In their competitive search for economic and political influence in the rest of the world, the US and the EU employed particularly different tools (military and commercial *versus* primarily commercial) during the 1990s. These different strategies may have stemmed in part from the fact that America's high-technology policies (the vigorous pursuit of the RMA included) had a "dissuasive effect" onto the EU nations well before the term was officially incorporated onto the US 2001 Quadrennial Defense Review.[157]

Finally, high-technology projects like *Airbus Industrie* and Galileo were initiated and began to enjoy commercial success at a time when serious industrial, commercial, and military disagreements were only beginning to reemerge across the Atlantic. Thus, they were perceived as less provocative in the late 1980s and during the 1990s, than, hypothetically, by 2010-15, when transatlantic tensions may well be worse than today.

[157] US Department of Defense, *Quadrennial Defense Review Report* (Washington, DC: US Department of Defense, September 30, 2001): 12.